UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. 54 — NOVEMBER, 1928 — No. 309

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A PRIZE NOT TO EXCEED FIVE HUNDRED DOLLARS WITH A GOLD MEDAL, and a life membership in the Institute (unless the author is already a life member, in which case he will receive the commuted value thereof), is offered by the Naval Institute for the best essay submitted on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. The award of the prize to be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.

2. Each competitor to send his essay to the Secretary-Treasurer in a sealed envelope marked "Prize Essay Contest." The name of the writer shall not appear on the essay, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary-Treasurer, with the motto on the outside and the writer's name and motto inside. This envelope will not be opened until after the decision of the board. Essays must be received on or before January 1, 1929.

3. In addition to the "Naval Institute Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify that award; or, in the event that no essay is adjudged of sufficient merit to receive the "Prize" the best essay submitted may receive "Honorable Mention" in lieu thereof.

4. In case one or more essays receive "Honorable Mention" the writers thereof will each receive a prize, the amount of such awards to be decided by the Board of Control in each case.

5. Announcement of awards will be made as soon as practicable after January 1, 1929.

6. Essays awarded the "Naval Institute Prize" or "Honorable Mention" will be published in the NAVAL INSTITUTE PROCEEDINGS as soon as practicable. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such articles shall be compensated at the established rate for articles not submitted in competition.

7. Articles shall be limited to eleven (11) printed pages in the PROCEEDINGS (approximately 8,000 words), but shorter articles will receive equal consideration.

8. In event of the prize being awarded to the winner of a previous year, a gold clasp suitably engraved will be given in lieu of the medal.

9. All essays must be typewritten, double spaced, and submitted in duplicate.

R. C. MACFALL
Captain, U.S.N., Secretary-Treasurer

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OF THE REVOLUTIONARY WAR 1782. REORGANIZED AND PERMANENTLY ESTAB-
LISHED UNDER THE CONSTITUTION OF THE UNITED STATES JULY 11 1798.

Courtesy Marine Corps Recruiting Bureau, Philadelphia. From a painting by J. Joseph Capolino

BIRTH OF THE MARINE CORPS, NOVEMBER 10, 1775

One of a group of paintings depicting the history of this famous organization.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

THE MARINE CORPS COLOR GUARD
China 1928.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

BELLEAU WOODS FROM THE SOUTHWEST
Showing the famous field of standing grain.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

BELLEAU WOODS FROM THE SOUTHWEST
Showing the famous field of standing grain.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

WIRE AT EDGE OF BELLEAU WOODS
View from westward over northern portion of the woods.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

THE "HUNTING LODGE" IN BELLEAU WOODS
Located in the northeastern part of the woods.

THE "HUNTING LODGE" IN BELLEAU WOODS
Located in the northeastern part of the woods.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

THE SHELL-TORN TREES OF BELLEAU WOODS
View from the westward.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

BELLEAU WOODS, NORTHWEST SECTION
Showing rocks that marked German machine guns.

showing rocks that marked German machine guns.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

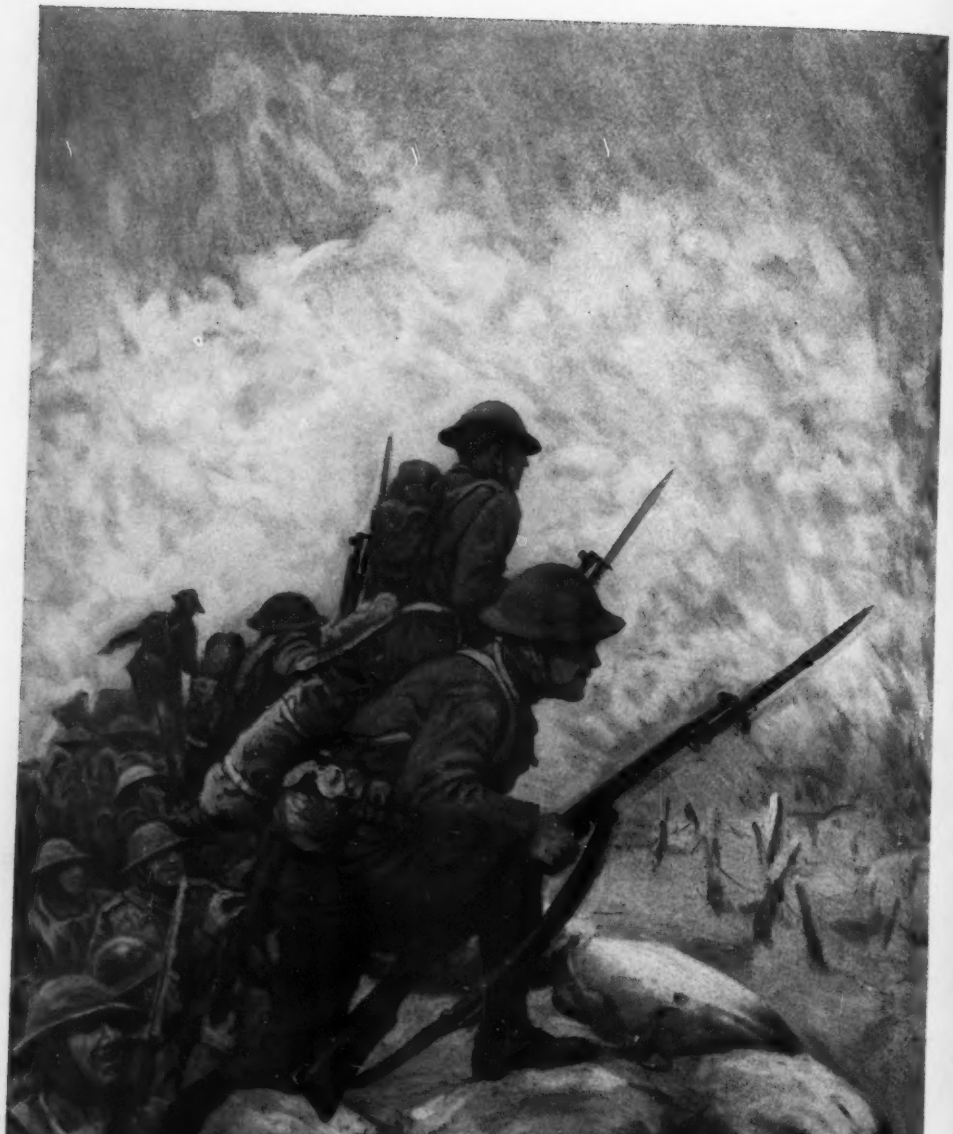
WHEAT FIELD EAST OF BELLEAU WOODS

Courtesy Marine Corps Recruiting Bureau, Philadelphia

VIEW OF BOURESCHES

UNIV. OF MICH.

VIEW OF BOURESCHES



"Ten Years Ago"

From Painting by STITT
Courtesy E. I. DU PONT DE NEMOURS & COMPANY

UNITED STATES
NAVAL INSTITUTE
PROCEEDINGS

Vol. No. 54, No. 11 NOVEMBER, 1928 *Whole No. 309*

Foreword

By MAJOR GENERAL COMMANDANT JOHN A. LEJEUNE, *U. S. Marine Corps*

FROM its very establishment, the Marine Corps has constituted an integral part of the Navy. It has played its part with the Navy in all of its achievements, both ashore and afloat. And it has never failed to receive expressions of appreciation of its efficiency as part of the Navy. With the object, therefore, of preserving to the Navy the marine with all his traditions, and the furtherance of the mission of the United States Naval Institute to advance professional, literary, and scientific knowledge in the Navy, the enrollment in the Institute's membership of a greater representation from the Marine Corps, and the inclusion always on the Board of Control of one member representative of the Marine Corps, is highly desirable.

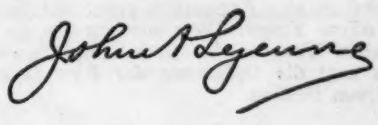
That the membership of the Institute now includes so many of our commissioned and other personnel known to the corps as among our most enlightened, progressive, and efficient, is as gratifying to the corps as it must be to the Institute. The educational advantages all members so enjoy is of peculiar worth to the Marine Corps. It is pleasing to the corps to note that under the authority of recent changes in the constitution, the first associate member in the history of the Institute to come from the enlisted branch of the naval service was furnished by the election of a sergeant of marines.

In furtherance of a policy originating a decade and a half ago, the PROCEEDINGS for November, 1928, a month whose tenth day is marked as the one hundred and fifty-third anniversary of the birth of the American marine, has been dedicated to the United States Marine Corps.

The willing, thoroughgoing, and practical devotion of the marine to the cause of his Navy, and of his country, is perpetuated in his motto SEMPER FIDELIS, and represents his most sacred tradition. We have always appreciated the superior importance of personnel over material. That famed "Esprit de Corps" attributed to the marines is but an evidence of the constantly increasing recognition of the importance of personnel over the material, more especially that quality of personnel animated by a general spirit of faith in, and loyalty to the organization and its purposes. No improvement in its material can outdistance in importance such a quality.

The dedication of this issue of the PROCEEDINGS, therefore, to the dissemination of information as to our organization, merits and receives this expression of the warmest appreciation of the Marine Corps. Good morale has been defined as sustained confidence with an ardent, enduring determination to do the utmost. That enthusiasm to perform efficient service springs, after all, from the wish to have that kind of service appreciated.

The United States Naval Institute, in placing before the service the objects of our loyalty, has given the marine a perspective that cannot fail to encourage the development of that superior morale which will accomplish efficiency, with harmony and contentment, in all branches of the naval establishment.



The Battles *for the* Possession *of* Belleau Woods, June, 1918

By Lieutenant Colonel Ernst Otto, *German Army (Retired)*

Translated from the German. See Secretary's Notes, Page 1029.

THE AMERICAN 1st Division had taken up its position in a relatively quiet sector. The 3rd Division had not yet been tested as a whole, although one of its units, the 7th Motorized Machine Gun Battalion, had taken a successful part in the Battle of Château-Thierry during the night of May 31/June 1. It was reserved for the 2nd Division, therefore, to give the answer to the then all-important question: How will the American troops behave in a pitched battle? Therein lay the significance of the battles for the possession of Belleau Woods.*

The stirring impression produced on the hard-pressed Frenchmen by the appearance of the Americans on the Western Front is pictured in vivid language by Pierrefeu in his book, *General Headquarters, Sector I:*

> Striking was the contrast in appearance between the Americans and the French regiments, whose men, in torn uniforms, hungry and hollow-eyed, were scarcely able to hold themselves erect. New life had come to bring a fresh, surging vigor to the body of France, bled almost to death. Thus it came to pass that in those crucial days when the enemy stood for a second time on the Marne, thinking us disheartened, then, contrary to all expectation, an ineffable confidence filled the hearts of all Frenchmen. . . . . General Pétain, who clearly discerned what a vital force they were radiating, thereafter repeatedly pronounced the word "Americans" with the satisfaction of the builder of imperishable monuments who perceives an inexhaustible source of labor in the midst of the threat of a general strike. . . . . General Foch, too, included the Americans as an essential factor in all his plans for the coming offensive.

The drama of the situation is enhanced when one remembers that this intervention came at a time when, at a meeting of the Supreme War Council at Versailles, the premiers of France, England, and Italy issued the following desperate appeal for help to President Wilson:

> There is danger that the war will be lost, unless the speedy arrival of additional American troops serves to restore the weakened Allied reserves. Thus only can defeat be averted, because of the exhausting of the Allied reserves long before those of the Germans.

How did the Allies come to be in such a desperate situation?

The German attack between Soissons and Reims had begun on May 27, with the storming of the supposedly impregnable Chemin des Dames Hill Range, and the French and English positions nearby. By May 30 they had reached the Marne. The French divisions thrown into this battle had been completely crushed; they evaporated, as a French officer aptly expressed it, like rain drops on white-hot iron. Not until June 1 could the French High Command interpose an organized resistance. The German High Command now added to the 7th Army, led by Colonel General von Boehn, four divisions which had been in the second line, namely, the 197th, 237th, 10th, and 231st Infantry Divisions. These troops were now grouped on the right wing

* Die 1 amerikanische Division war zunächst an einer ruhigen Front eingesetzt worden, die 3 Division hatte zwar schon in der Nacht vom 31 Mai/1 Juni mit ihren Kraftwagen-Maschinengewehr-Bataillon 7 bei Château-Thierry erfolgreich in den Kampf eingegriffen, wurde dann aber nicht einheitlich verwendet. So war es der 2 Division vorbehalten, eine Antwort zu geben auf die damals noch offene Frage: "Wie werden sich die amerikanischen Truppen im Grosskampf bewahren?" Darin liegt die Bedeutung der Kämpfe um den Wald von Belleau.

THE GERMAN OFFENSIVE, MAY 27 TO JUNE 13, 1918
The heavy line through Montdidier and Reims shows the German lines on May 27.

of the 4th Reserve Corps, commanded by General of Infantry von Conta, who had then reached the Marne. The mission of this corps was a fan-shaped advance to the southwest, while the advancing corps under Winckler, Wichura, Larisch, and François, took up their positions to the right, facing west. In advancing toward the west, the German High Command hoped to reach Compiègne, and then, by an attack at Noyon, to close the pocket that had been formed there.

There was no intention, however, that the four divisions pushing southwest should make a thrust for Paris. Even if successful this would have created a front in the shape of a spearhead, unfavorable both strategically and tactically. Their mission was therefore limited to protecting the flanks of the corps advancing to the west. The four divisions were followed by two more, the 5th Guard Infantry and the 28th Infantry Divisions, detached from the forces which had reached the Marne. Château-Thierry was taken on June 1, after intense house-to-house fighting, by the 231st Infantry Division, advancing on the left wing. Owing to the timely arrival of American troops, however, they did not succeed in establishing a bridgehead to the railroad on the southern bank of the Marne, as they had been ordered to do. The other three divisions kept up a powerful advance to the southwest, and during the night, June 1/2, pushed back the opposing troops everywhere, breaking the French line sharply in the neighborhood of Gandelu, over a front of four kilometers. Again American troops had to be moved to the front to cover this break.

The German divisions were still attacking on June 3. The 197th Infantry, which had advanced farthest on the right flank, succeeded that day in occupying Veuilly, Eloup, Bussiares, and Hill 164, close to Les Mares Farm. On the other hand every effort made by the 28th Reserve Regiment to penetrate Veuilly Forest failed; intense machine-gun fire stopped the German troops at the edge of the woods. Under cover of approaching darkness, the 2nd and 4th Companies, supported by a mine thrower, again attempted to penetrate the woods, but were once more repulsed by the fierce enemy fire. This extraordinarily strong resistance was entirely unexpected by the Germans, who thought that they were pursuing a beaten foe. They had no means of knowing that on June 2, the American 23rd Infantry Regiment, the 1st Battalion of the 5th Marines, the 5th Machine Gun Battalion, and the 2nd Engineer Company, had established strong defenses here, with the 2nd Battalion of the 5th Marines adjoining them on the right.

The 237th Infantry Division, with the 462nd Infantry Regiment, was to occupy Hill 142 and Champillon that day, and then proceed to Marigny, while the 461st Infantry Regiment was to attempt the capture of Lucy-le Bocage. As the artillery was not ready to open fire until 12:15 P.M., the attack could not be launched until 12:30 P.M. The 462nd Regiment then found such formidable resistance in the strongly defended woods on its front that it could advance only as far as one kilometer south of Torcy, north of the woods. During the night the 462nd Infantry was relieved by the 460th. The 461st Regiment now completed the occupation of Belleau Woods, pressing forward as far as the western edge. After repulsing an enemy counterattack at 3:00 P.M., they cleared the southwest corner of the woods of enemy machine-gun nests, and pushed their advance posts far to the southwest and to the southern edge of the woods. The whole woods now came under severe artillery fire of every caliber, which continued throughout the day and the following night. The attack on Lucy-le Bocage was abandoned, because this place was under enfilading fire from the heights near Triangle.

The 10th Infantry Division, which had taken Bouresches on June 2, was now working up its defenses, as ordered.

At midnight, June 3, General von Conta issued the following order to his corps:

1. The right wing of the 7th Army will continue the attack, the Conta Group assuming the protection of the flanks during the attack. The group will fight for *a suitable defensive position.* This position is located in the following line: Veuilly—Marigny—La Voie du Châtel—Hill 201 about one kilometer southeast of Montgivrault—Le Thiolet—Hill 204 west of Château-Thierry.*

2. The exact hour of the attack will be ordered later. The attack will not take place prior to June 7. Get necessary information and prepare at once.

* See map page 960.

In this attack the 5th Guard Infantry Division was to be placed on the right, next to the 197th Infantry Division.

This, then, was the situation on the night of June 3. The American troops, fresh and in full strength, had absorbed the remnants of the crushed French troops. Facing them were the Germans, with morale heightened by the habit of victory, but with ranks considerably worn and thinned by the campaign. The Americans formed such a formidable wall that the commanding general, von Conta, found it necessary to spend several days in preparation, and to add another division preliminary to an attack which had for its objective merely the capture of a defensive position.

On June 4, at 9:00 A.M.,* the exhausted French 45th Infantry Division was relieved by the American 2nd Division on the Champillon-Monneaux front, where the Americans had actually established themselves on June 3. On their left was the newly arrived French 167th Infantry Division, which had relieved the shattered 43rd; parts of the American 2nd Division stationed here had to be withdrawn from the remnants of the French 43rd Division. On their right was the French 10th Colonial Division, among whom were isolated units of the American 3rd Division. This led the Germans to believe that they were facing the American 3rd Division. It was by design that the French, who had no confidence yet in the American leadership, thus avoided having here the American 2nd and 3rd Divisions united under their own commanding general, as would have been natural. It was not until September 2 that the Americans were allowed an independent sector of their own.

In general, the positions were as follows:

Facing the American 5th Marines was the German 460th Infantry Regiment of the 237th Division.

Facing the 6th Marines was the 461st Infantry Regiment of the same division.

Facing the 9th Infantry Regiment was the 398th Infantry Regiment of the 10th Division; and facing the 23rd Infantry was the 47th Infantry Regiment of the 10th Division.

This alignment is only approximate. The front of the American units of the 4th Brigade extended farther east than the German regiments opposite them, so that the right wing of the 5th Marines was opposite the right wing of the 461st Regiment, and, similarly, the right wing of the 6th Marines overlapped the right of the 398th Regiment at Bouresches.

The German divisions spent that day, June 4, solely in strengthening the positions they had reached, with the 10th Infantry Division established on the hills north and east of Bouresches. This place had originally been occupied by the 3rd Battalion of the 398th Regiment, but, owing to the lowness of the ground, it did not appear advisable to leave a whole battalion here, and to persist in holding it at any cost. Accordingly, the commander of the 398th Infantry ordered two companies withdrawn on the night of June 3/4, and ordered further that the railway be made part of the main defense line. Bouresches was to serve only as an outpost. On the main front, the battalions intrenched themselves by companies, with machine gun companies distributed in separate nests to the rear. Small outposts were extended as far as the heights of Triangle and the Bouresches-La Roche-Vaux road.

In the morning, the 461st Infantry Regiment ascertained through prisoners and dead that they were facing the American 5th and 6th Marines. Major Bischoff, the commander, reported in the afternoon that an American attack was being made in the direction of Belleau and the northwestern corner of Belleau Woods. It was natural that a unit attacking for the first time would not have the skill of seasoned troops, and it was equally natural that the Germans should count on that lack of experience. The Americans were caught front and flank by the machine-gun fire of the 1st Battalion, 461st Regiment, and, after heavy losses, retired to Hill 169. However, the defenders of the woods suffered greatly from the effects of the continuous heavy artillery fire, in which the American 2nd Field Artillery Brigade, posted along La

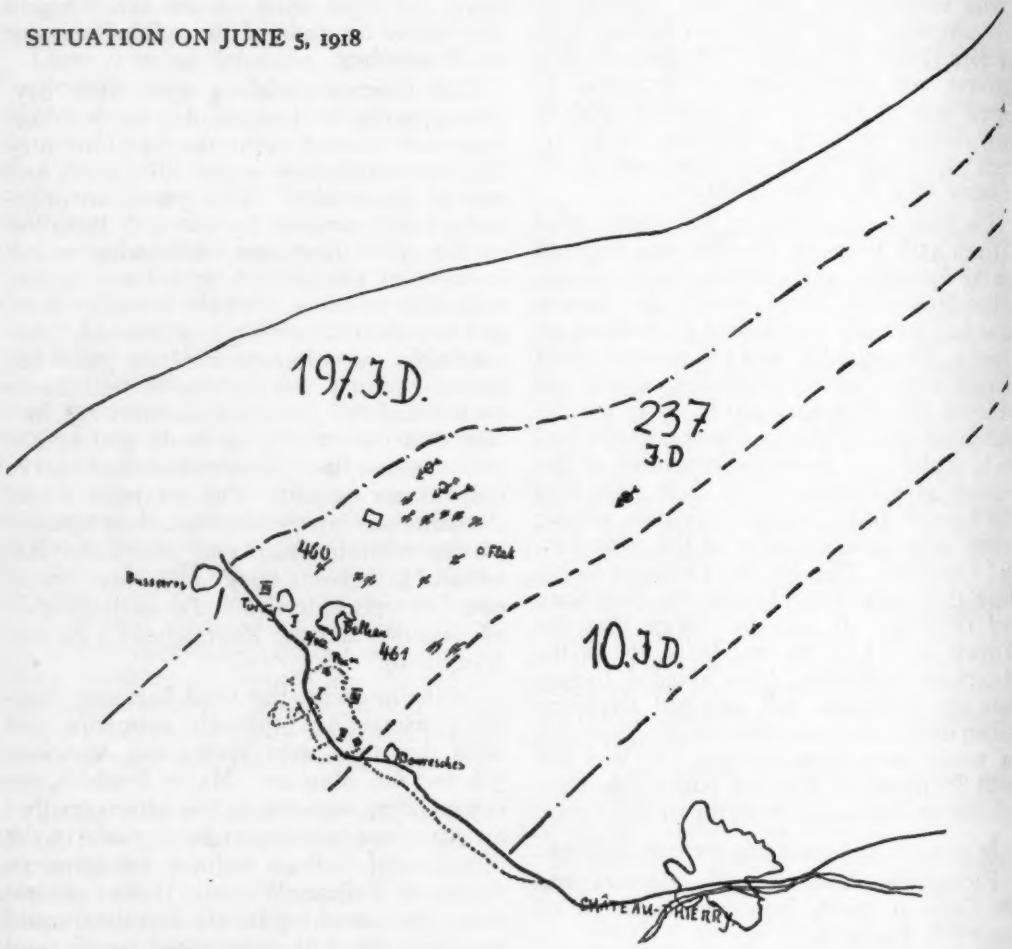
*In this account, Central European time is used. It differs by one hour from Western European time. As daylight-saving time was used on both sides, this difference continued throughout June. Accordingly, 9:00 A.M. in the German account corresponds to 8:00 A.M. in the American account.

Voie du Châtel-Coupru, took a very prominent part.

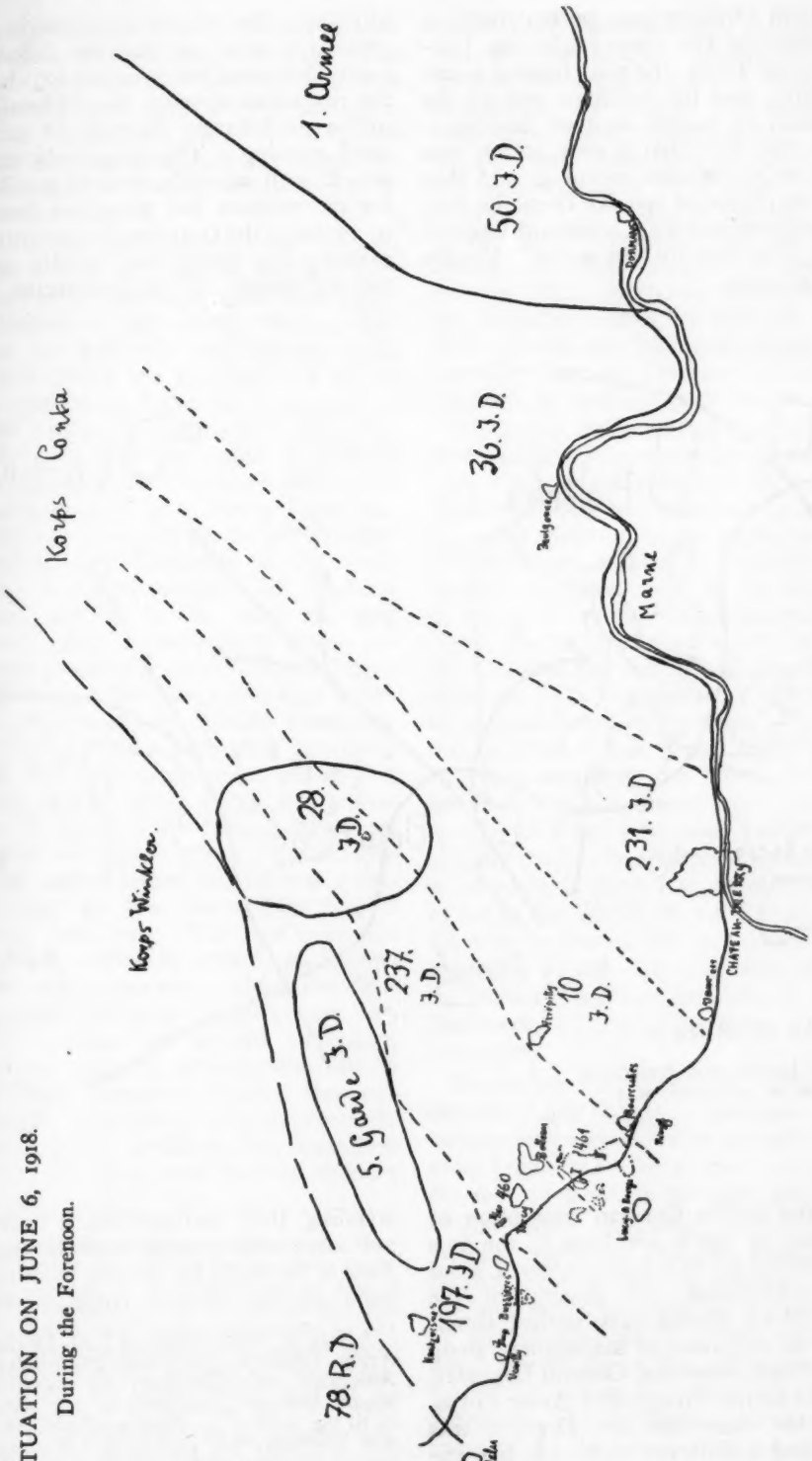
June 5 was rather quiet, except for a French attack in the direction of Gandelu and Veuilly, which pushed back the German outposts to the edge of the village, the village itself being retained. There were also sporadic attacks by the Americans along the front of the 461st Infantry, which were repulsed, with many dead in front of the German positions; prisoners confirmed that the American losses were heavy. These daringly conducted raids served to convince General von Conta that he had before him a strong and enterprising foe. Accordingly, on June 5 he issued the following order:

> The attack ordered on June 3 is for the present deferred. However, the attack is to be so thoroughly prepared that it could be made within forty-eight hours after receipt of the order.

SITUATION ON JUNE 5, 1918

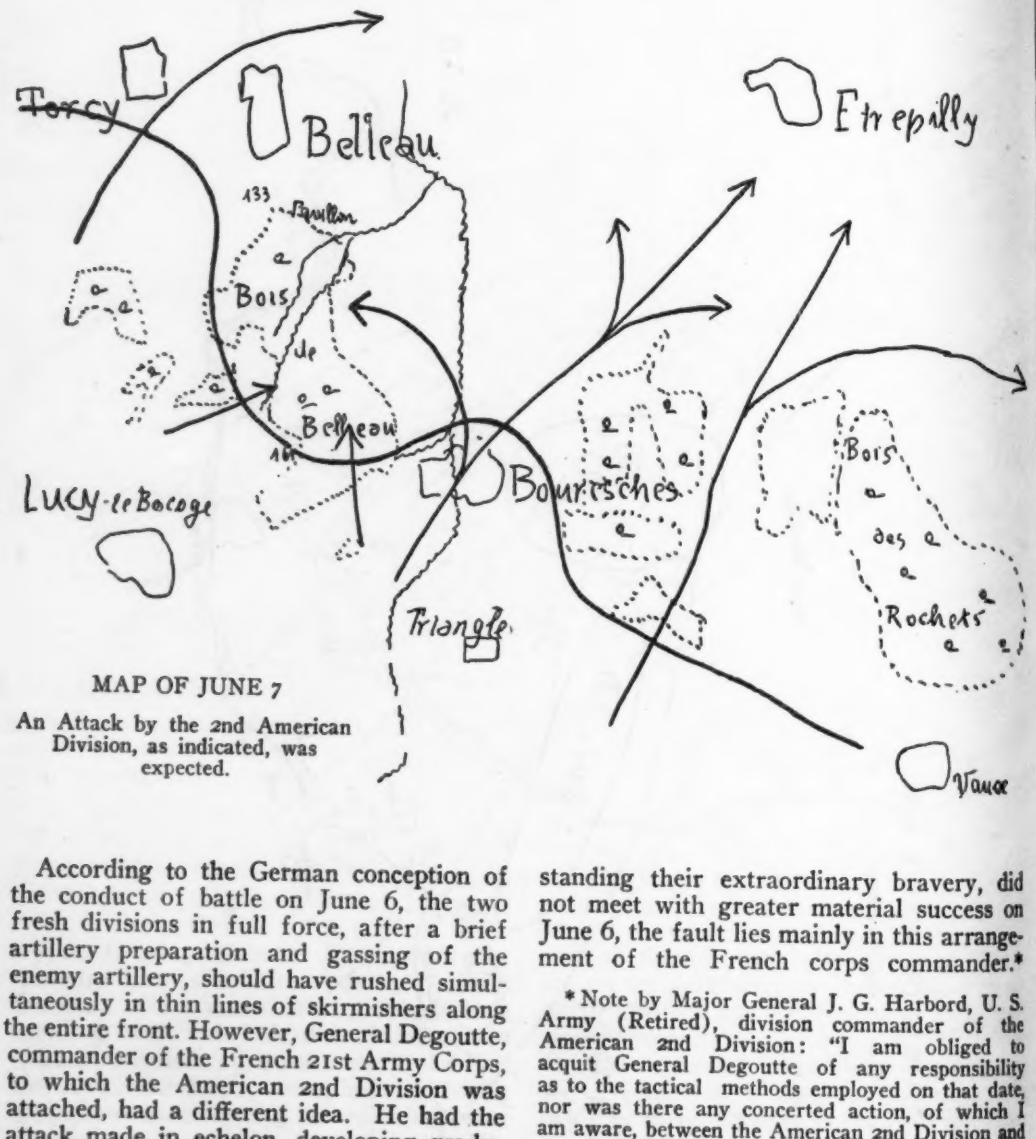


With the German battalions thus standing on the defensive, on June 6 the French 167th Division and the American 2nd Division launched a combined attack. The French succeeded in entering Veuilly, but were ejected in a vigorous counterattack made by two companies of the 28th Replacement Infantry Regiment. The left wing



SITUATION ON JUNE 6, 1918.
During the Forenoon.

of the 197th Division was pushed back to a line including the cross-roads one kilometer west of Torcy, the road leading south of Bussiares, and the northern end of the square patch of woods west of Bussiares. Owing to the fact that a new attack was expected early the next morning, and that his position projected too far from the line, the division commander, Lieutenant General Wilhelmi, voluntarily evacuted Veuilly during the night.



MAP OF JUNE 7

An Attack by the 2nd American Division, as indicated, was expected.

According to the German conception of the conduct of battle on June 6, the two fresh divisions in full force, after a brief artillery preparation and gassing of the enemy artillery, should have rushed simultaneously in thin lines of skirmishers along the entire front. However, General Degoutte, commander of the French 21st Army Corps, to which the American 2nd Division was attached, had a different idea. He had the attack made in echelon, developing gradually from the left to the right in assigned periods of time, so that the different regiments followed one another into battle like the ribs of an opening fan. The right wing of the 4th Infantry Brigade did not advance until evening. This ingenious method of attack, well suited in view of possible flanking movements, had the great disadvantage of enabling the Germans to concentrate their artillery fire every time exactly on the attacking troops. If the Americans, notwithstanding their extraordinary bravery, did not meet with greater material success on June 6, the fault lies mainly in this arrangement of the French corps commander.*

* Note by Major General J. G. Harbord, U. S. Army (Retired), division commander of the American 2nd Division: "I am obliged to acquit General Degoutte of any responsibility as to the tactical methods employed on that date, nor was there any concerted action, of which I am aware, between the American 2nd Division and the 167th French. With the information we had

Precious American blood, and much of it, was shed, without any necessity. The difference between the German and the French methods is very clearly shown in the map of June 7, page 946. This map also shows in what manner the Germans expected the attack of the American 2nd Division to be carried out.

In accordance with orders from General Degoutte, at 4:45 A.M. the 1st and 2nd Battalions of the 5th Marines joined the French 167th Division in the attack, the 1st Battalion on the left, the 2nd on the right. This attack struck the 1st Battalion of the 460th Regiment, and the 9th Company of the 462nd Regiment, echeloned to the right. As the French had succeeded in making a temporary entry into Bussiares (they were ejected at 9:45 A.M. by a Saxon Jäger battalion), the 9th Company of the 462nd Regiment, and the 9th Company of the 460th Regiment, were surrounded by superior forces and cut off in the early morning hours, and, after a particularly brave defense, were practically annihilated. Only a small number of the 9th Company, 460th Regiment, succeeded in fighting their way back to their battalion with their bayonets. The 10th and 11th Companies, 460th, dug themselves in, in their patch of woods southwest of Torcy, in the face of the enemy attacking on all sides. They repulsed the attack with severe losses, but were continually harassed by low fliers who almost touched the tree tops. The few available reserves were rushed in turn to the places where the enemy was approaching the closest, sometimes within a few paces. A vigorous counterattack by the 12th Company, 460th, whose company commander fell in this comradely endeavor, cleared the way to the north. The enemy now covered the woods with heavy artillery fire, including gas shells. To have sent further support would have entailed severe losses; the regimental commander, Lieutenant Colonel Tismer, therefore decided to withdraw both companies. Of course, this could only be done after dark. Accordingly, these two hard-pressed companies withstood the enemy attacks most creditably during the whole day. In order to support the front of the 460th Regiment, the 2nd Battalion, 462nd, was now wedged in between the 3rd Battalion, 460th, on the right, and the 1st Battalion, 460th, on the left; the right flank of the 3rd Battalion, 460th, was secured by the 10th Company, 462nd, and by establishing flanking machine-gun nests.

Following the orders of the Conta Group, the 237th Division was now required to take over a strip heretofore covered by the 197th Division. The 2nd Battalion, 460th, therefore took position to the right, next to the 3rd Battalion, 460th. At nightfall the regimental alignment was to be reëstablished as follows: the 2nd Battalion, 460th, to the right; the 1st Battalion, 460th, to the left; the 2nd and 3rd Battalions, 462nd, and the 10th and 11th Companies, 460th Regiment, to be established to the rear. To facilitate this, at 7:30 P.M. a heavy artillery barrage was directed along the front of the entire position. In the meantime, a raid by the enemy at 6:00 P.M. was easily repulsed. Despite the heavy artillery fire, enemy raids were made at 8:00 P.M. at different points as far as the line of the 1st Battalion, 460th. They were beaten off by a powerful counterattack of the 1st Company, 460th, and the flanking machine-gun fire of the 461st Regiment. Three Americans were taken prisoners.

By 11:00 P.M. the 460th Regiment had completed the change of position. The two companies surrounded in the grove slipped away from the enemy in good order, without the loss of a single machine gun.

The 461st Regiment, holding Belleau Woods, reported that at 6:30 A.M. the Americans had made a surprise attack on the 2nd Battalion, holding the eastern half of the woods, but that the attack broke down on the front line. The southeastern tip of the woods had been left out of the defensive line on June 5, presumably because of the danger of a surrounding movement.

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had that the woods were unoccupied by the Germans, we gave it no artillery preparation, thinking thereby to take it by surprise or to find it unoccupied. Occupied as it was by machine gun nests well placed, the tactical formation of the time, which was the advance in successive waves as we were then being taught, did entail considerable losses. My recollection is that the attack took place late in the afternoon. Colonel Otto starts it at 4:45 A.M. He is probably confusing our attack on the woods with the French attack on Bussiares."

The enemy's intentions were obvious, as his artillery fire became more intense, particularly in the region east and north of Bouresches, while the activities of his flyers became more pronounced. The division commander, Major General von Diepenbroick-Grüter, at 6:50 P.M., issued the following order: "We must expect continuous attacks on the front of the 10th Division."

The attack of the 3rd Battalion, 5th Marines, and the 2nd and 3rd Battalions, 6th Marines, late that evening, was therefore not at all unexpected by the Germans. It was directed chiefly against the left wing of the 398th Regiment, particularly the 1st Battalion, and the right wing of the 47th Regiment, the 1st Battalion. The Americans were obliged to come down from the heights they were occupying before the eyes of the Germans. They did this in thick lines of skirmishers, supported by columns following immediately behind. The Germans could not have desired better targets; such a spectacle was entirely unfamiliar to them. Under similar conditions, German troops would have advanced in thin lines of skirmishers following one another like waves, or in small, separate units of shock troops, moving forward in rows with their light machine guns, utilizing whatever shelter was offered by the terrain until they were in a position to open fire. It was thus that the French had advanced the same day, through the grain fields, until they had crept close to the German defenders. However, when one considers that this was their first real fight this procedure of the Americans is by no means suprising. Troops coming under fire for the first time often proceed in just that way. The German soldiers of 1914, generally conceded to have constituted the best army ever known, often advanced in almost the same way as the Americans did on this occasion, despite orders to the contrary. This is evident from the French and English descriptions of the early battles. And yet in those days they defeated all the French and English armies, driving them back of the Marne, although they suffered great losses, particularly in officers. It is, therefore, perfectly clear why the vigorous American battalions adopted that method of advancing to the attack. And it was only natural that the entire artillery, machine-gun, and infantry fire of the defenders should have been concentrated on these advancing masses. It was thus that the first attack broke down with severe losses.

This failure by no means disheartened the Americans. They kept on attacking with tenacity. Gradually the German artillery fire to the westward became weaker, as they themselves were under heavy fire from the enemy, and suffered great losses. The artillery battery of the 21st Infantry, for example, had three men left at the guns at 8:55 P.M., and it was, of course, impossible to keep up an effective barrage. All officers, non-commissioned officers, and other personnel were either dead or wounded. It thus became easier to run the barrage. Making good use of the bed of a brook, the 2nd Battalion, 6th Marines, at 8:30 P.M. succeeded in entering Bouresches. As has been seen, there was here only an outpost consisting of the 7th and 8th Companies of the 398th Regiment. After a furious house-to-house battle, they were ordered to withdraw to the main defense line, to avoid being cut off.

Now began a struggle of unexampled obstinacy. The American battalions set about their mission of capturing Belleau Woods, the Bouresches railway station, and Hills 126 and 133, unconditionally resolved to the last man to do so, cost what it might. But the German battalions defended this, their main defense line, with equal determination. After bitter fighting the Americans finally had to give up the struggle, but with the village of Bouresches in their possession. The heroic spirit with which these brave troops attacked will be realized from the fact that, in front of the 4th Company, 398th Regiment, alone, 100 American dead were counted the following morning. On the German side, too, occurred something generally considered very rare in the war; the infantry, particularly the 1st Battalion, 398th, had almost completely exhausted their ammunition. An emergency supply had to be brought up during the night by the 3rd Battalion, 6th Grenadier Regiment, which had been stationed to the rear. The division commander now sent the 2nd and 3rd Battalions, 6th Grenadiers, to support the 398th Regiment. The rifle strength of each of the battalions, however, did not exceed 200. The 3rd Battalion, 6th Grenadiers, was posted in the northwestern corner of the woods, near Rochette Farm;

the 2nd Battalion was echeloned behind the right wing of the 398th Regiment.

After the 398th Regiment was thus protected against a further expected attack from Bouresches, Lieutenant Colonel Rotenbücher, commander of the 47th Infantry Regiment, ordered the 1st Battalion, on whose right wing the 4th Company had given way before the American attack at 7:30 P.M., to eject the enemy that had penetrated the wood patch east of Hill 192. Captain Rickert, the battalion commander, conducted this counterattack with unusual skill. He waited until dusk, and until after the enemy captive balloon had been hauled down. From 9:10 to 9:14 P.M., the enemy were showered with machine-gun fire from a northerly direction. Here, too, he left the 2nd and 3rd Companies. In the meantime, the 1st and 4th Companies advanced, unobserved, through a ravine southeast of the wood patch, in the vicinity of Point 175. At 9:14 P.M. the two companies threw themselves on the enemy, whose whole attention had been turned to the north. In the ensuing fight in the woods, Lieutenant Glückert fell, wounded, into the hands of the enemy, but the surprise attack was a complete success. The enemy sought to save themselves by a hasty retreat in a northerly direction, but thus came under the hot fire of the 398th Infantry. Here too, numerous dead and wounded Americans covered the field, some of the wounded begging for water in German.

The total losses of the 10th Infantry Division on June 6, were as follows: killed, 24; wounded, 101; missing, 2 officers and 24 men. The losses of the 237th Division were considerably greater: killed, 6 officers and 72 men; wounded 10 officers and 218 men; missing, 5 officers and 90 men. The 237th Division took 40 American prisoners; the 10th, 7 Americans.

Thus ended the battles of June 6. Both sides have reason to be proud of the deeds of their young men there.

June 7 was comparatively quiet. The right wing of the 197th Division withstood an attack by the French from the direction of Gandelu, losing a little ground. During the night this division was relieved by the 5th Guard Division.

At noon the 237th Division received reports of a concentration of enemy infantry in the woods between Torcy and Lucy-le Bocage. This pointed to an attack on the 461st Regiment. Accordingly the 1st Battalion, 462nd Regiment, was assigned to the 461st as a reserve. In the afternoon, after a strong artillery preparation, the Americans actually did try an attack along the entire front of the regiment. On the right wing the attack broke down in the German advanced positions owing to a hot machine-gun fire; on the left wing, the Americans advanced on the line from Hill 181 to the left, but they were finally driven off. Whether a major attack had been planned or whether it was simply a local demonstration, has not been determined.

The losses of the 237th Division on that day were: killed, 9 men; wounded, 68; missing, 8.

The 10th Division also believed that it nipped in the bud an enemy attack in the early morning hours of June 7, by a combined artillery, machine-gun, and infantry fire. A patrol from the 10th Company, 398th, found Bouresches strongly occupied by American forces. Some of their trucks on the way to the rear came under a vigorous German machine-gun fire. During the night of June 7/8, the 47th Regiment was relieved by the 444th Regiment of the 231st Division. The division now extended its quiet front to the west by the width of a regiment.

The losses of the 10th Division amounted to 2 officers and 8 men killed, 1 officer and 50 men wounded, and 13 men missing; there were also 3 officers and 20 men gassed, having inhaled German gas.

An incident very characteristic of the bold behavior of the Americans took place that day near the 231st Division. During the relief of the 1st Battalion, 442nd Regiment, by the 2nd Battalion, on Hill 204, some men of the 8th Company suddenly came upon Americans and Frenchmen on top of the hill in a clearing which divides the southern part of the woods. Two startled Americans were captured, and were led behind the lines by some food carriers of a machine gun company. But despite all their efforts, the Germans could not get a clear statement from them. However, it was believed that a strong enemy patrol had pushed in between the 6th and 8th Companies during the relief operations. Due to the impene-

trable underbrush and the heavy machine-gun fire, the 8th Company failed to dislodge them, as did a counterattack by the 3rd and 4th Companies along the edge of the woods, ordered by Major von Görne, the regimental commander. Another attack made by the 3rd Battalion, 442nd Regiment, also ended in failure.

The division commander, Major General von Hülsen, then issued an energetic order to clean out that "American nest." The efforts were repeated on June 8, and again on June 10, but the intruders, no doubt considerably reënforced by the French, held their own, notwithstanding the fact that they were hemmed in by a semicircle of the 442nd Regiment. Their tenacity was so great that, finally, all efforts to dislodge them were given up. The German position on Hill 204 was strongly fortified to form a ring around the "American nest."

On June 8, at one o'clock at night, the 460th Division asked the 237th Division for a barrage, but the threatened enemy attack did not materialize. At 1:30 A.M., however, the 461st Regiment, stationed on their immediate left, repulsed an attack made in strong force after a drum fire of fifteen minutes.

At 5:00 A.M. came an attack against Belleau Woods by the 3rd Battalion, 6th Marines, reënforced by one company of the 2nd Battalion, 6th Marines, and two companies of the 2nd Engineers. The 461st Regiment made the following report concerning this attack:

> At 5:00 A.M. the enemy renewed his attack along the entire front of this regiment. Beaten back everywhere else, he succeeded in penetrating on the left wing, favored as he was by the possession of Bouresches. A counterattack by the 6th and 8th Companies, 461st, and the 365th Engineer Company, threw the Americans back to their original position in the woods. The mass of dead lying in front of the point where they temporarily broke our line indicates that the enemy suffered great losses. Forty prisoners were taken by the 461st Regiment.

The losses of the 237th Division were: 2 officers and 49 men killed, 8 officers and 128 men wounded, and 2 men missing.

At 2:00 A.M. an attack was made against the 398th Regiment, 10th Division, by the American 34th Infantry Regiment, but was beaten back with great losses. Attempts by our own men during the early morning hours to bring in the American wounded lying along the front failed because the enemy evidently misunderstood the attempt, and fired on the hospital unit. During the night of June 9, the 398th Regiment was relieved by the 109th Grenadier Regiment of the 28th Division.

The losses of the 10th Division on June 8, 9, and 10 were 5 men killed, 1 officer and 29 men wounded, and 18 men sick.

With the relief of the 197th Division by the 5th Guard Infantry Division, and of the 10th Division by the 28th, the division fronts were shifted to the right by the width of one battalion. The front of the 5th Guard Division was narrowed; the 197th Infantry Division was required to take over Bussiares during the night of June 8/9; and the 40th Regiment of the 28th Infantry Division was shifted to take over the eastern half of Belleau Woods. This last, as we will see later, proved fateful.

Lieutenant General von Jacobi, commander of the 237th Division, which has held our interest so much, had among his officers some outstanding regimental commanders. Lieutenant Colonel Tismer, commander of the 460th Regiment, to which had been assigned the 3rd Battalion, 462nd, and a company of shock troops, to take over Bussiares, anticipated the events of the coming day in the following order, issued at 11:25 P.M.:

> If the enemy attacks tonight at Bussiares or Torcy and breaks through anywhere, a counterattack should be made immediately, if possible, in order to gain ground that can be used later as an advanced position if it offers favorable facilities for defense.

The 3rd Battalion, 462nd Regiment, and the company of shock troops were to enter Bussiares; the 3rd Battalion, 460th, and the 1st Battalion, 462nd, were to hold themselves in readiness in the hollow near Licy-Clignon.

Such was the situation when the enemy, at 4:40 A.M. on June 9, after a vigorous artillery preparation, attacked the front of the 5th Guard Infantry Division and Bussiares. They succeeded in pushing back the 20th Regiment of the 5th Guards, which was unacquainted with the ground, and in surrounding several of its companies in the triangular wood patch southwest of Bussiares, but they were unable to force their way into the village. At 8:00 A.M. they in-

creased their artillery fire, with considerable use of gas shells. At 9:30 A.M. they made a furious attack, and, after a violent house-to-house fight, penetrated into Bussiares. Thereupon followed a terrific counterattack of the 2nd and 3rd Companies of the 460th Regiment. In full force, they threw the enemy out of the village and followed him to the heights southeast of Bussiares. They established positions here, but were compelled to return to the southern edge of Bussiares, because they were suffering from the short-range fire of their own artillery. The enemy held out in some of the houses on the western edge until 4:30 P.M., when they were ejected. During the night, the 3rd Battalion, 460th Regiment, occupied Bussiares, relieving the 3rd, 462nd.

The 461st Regiment repulsed an attack during the night, and again at 5:00 A.M., another American attack directed along the entire front of the regiment. It was learned from statements of prisoners that the attack had been made by the 5th and 6th Marines and the 23rd Infantry, but that it had been repulsed with heavy losses.

The losses sustained during these daily battles had reduced the companies of the 461st Regiment to such an extent that it became necessary to put almost the entire regiment on the front line, in order to attain the required strength in our main defensive line. There remained in reserve only the 3rd Company, directly behind the 1st Battalion; the 9th Company, behind the 2nd Battalion; the 365th Engineer Company, directly behind the left wing; and the 366th Engineer Company, near the center. Major Bishchoff, the regimental commander, a veteran in African bush and forest fighting, had thus far been able to repel all American attacks by those methods. During the night of June 10, he was to turn over the left half of his regiment's front in Belleau Woods to a battalion of the 4th Regiment, 28th Infantry Division. From the officer sent in advance he learned that this battalion was to relieve six weakened companies of his regiment by stationing only two companies on the main defense line, while the other two companies were to be echeloned east of the woods. Major Bischoff protested at once. He insisted that the customary procedure must be avoided; that the woods were so thick that a counterattack coming from a deep position would be ineffective. His arguments did not prevail, however, as the plans of the 28th Division had already been approved. Major Bischoff had a presentiment of what was to be enacted on that scene in the next few days. To provide against the worst, he left six heavy machine guns in the relinquished position, but unfortunately only for twenty-four hours.

The losses of the 237th Division on June 9 amounted to 40 men killed, 6 officers and 163 men wounded, and 3 officers and 57 men missing. Those of the 28th Division, which had taken over the new front at 10:00 A.M., were 9 men killed, 1 officer and 44 men wounded.

The commander of the 28th Division, in his order of the day, dated June 8, addressed his tired troops as follows:

> An American success along our front, even if only temporary, may have the most unfavorable influence on the attitude of the Entente and the duration of the war. In the coming battles, therefore, it is not a question of the possession or non-possession of this or that village or woods, insignificant in itself; it is a question whether the Anglo-American claim that the American Army is the equal or even the superior of the German Army is to be made good.*

Nowhere is the thought more clearly expressed than in this order of Major General Böhm.

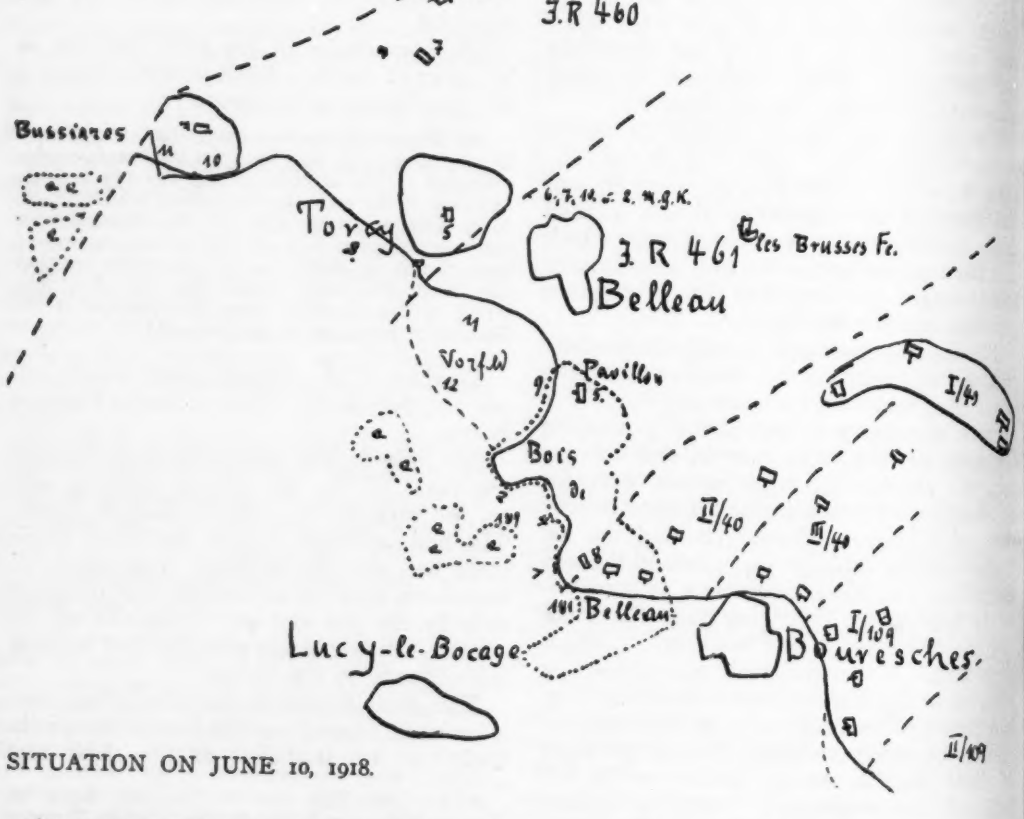
On June 10, the main defense line along the front of the 5th Guard Division was shifted back to the north of Clignon Brook. The main defense line of the 460th Regiment was also drawn back. The village of Bussiares, now but an outpost, was occupied only by the 3rd and 4th Companies of the 460th. This shift was accomplished without interference by the enemy.

The 461st Regiment had now taken over a battalion front from the line of the 460th. Only the 1st Battalion of the 461st was

* Der Div. Kdr. der 28 Jnf. Div. hatte im Tagesbefehl vom 8 Juni seinen müden Truppen zugerufen: "Gewinnen die Amerikaner vor unserer Front auch nur vorübergehend die oberhand, so kann dies auf die Stimmung der Entente und auf die Dauer des Krieges den ungünstigsten Einfluss ausüben. Bei der uns bevorstehenden Gefechstätigkeit handelt es sich also nicht um Besitz oder Nichtbesitz eines an und für sich gleichgültigen Waldes oder Dorfes, sondern um die Frage, ob es der englisch-amerikanischen Reklame gelingen wird, das amerikanische Heer als eine dem deutschen Heere ebenwürtige oder gar überlegene Truppe hinzustellen." Nirgends ist dieser Gedanke so klar zum Ausdruck gebracht, wie in diesem Befehle des Generalmajor Böhm.

now left in Belleau Woods. An attack on this battalion at 5:00 A.M., preceded by the heaviest artillery preparations, was repulsed by machine-gun and artillery fire. At the same time the Americans made an attack against the 2nd Battalion of the 40th Regiment, in the eastern half of the woods. This attack and a further one from the direction of Bouresches were both repulsed.

At 3:30 A.M. the enemy artillery fire had reached its maximum effectiveness. At 5:30 A.M. the 1st Battalion, 461st, was attacked in the western half of the woods. Our demand for an artillery barrage received no answer, as our signal lights could not be seen through the heavy fog. Nevertheless, this attack was beaten off. Fifty American dead lay along the front of the battalion.



SITUATION ON JUNE 10, 1918.

The losses of that day amounted to 1 officer and 36 men killed, 5 officers and 132 men wounded, and 4 men missing, in the 237th Division; 137 men killed, 247 wounded, and 50 missing, in the 28th Division.

We now come to the decisive American attack of June 11, executed mainly by the 2nd Battalion, 5th Marines, and the 1st Battalion, 6th Marines.

Immediately after, however, the enemy broke through the right wing of the 2nd Battalion, 40th Regiment, and appeared on the flank and rear of the 1st and 4th Companies of the 461st Regiment. Favored by the fog, he immediately renewed his attack on the front of the two companies. After a bitter night battle, the German companies lost three officers and eighty men as prisoners; the rest fought their way through

by bayonet to the north, where they were incorporated into the 2nd, 3rd, 5th, and 7th Companies of the 461st Regiment, under Major Hartlich, the battalion commander. Major Hartlich, after building a strong barricade in the woods, marched at the head of his companies to the counterattack, sweeping along, by his own example, those units exhausted by the struggles of the day. This spirited procedure had its effect; by noon the 1st Battalion, 461st, had regained its position.

Upon being informed of the enemy incursion, the commander of the 237th Division advanced the 1st Battalion, 462nd Regiment, into the wood patch near Les Brusses Farm, and the 2nd Battalion, 462nd, to point 182. The hard-pressed 1st Battalion, 461st, was reënforced by the 1st and 3rd Companies of the 462nd, and two machine gun platoons. It should be noted here that in the 1st and 2nd Battalions of the 460th Regiment the number of influenza cases began to increase about this time to an alarming degree.

On the front of the 2nd Battalion, 40th, in the eastern part of the woods, the first American attack had been repulsed by the 7th and 8th Companies. However, owing to the thinness of the lines—against which Major Bischoff had protested in vain—the Americans succeeded, in a second attack, in breaking through the right wing of the 2nd Battalion, 40th Regiment. In this operation the Americans made good use of the bed of a brook which ran through the middle of the woods in a northeasterly direction. The captain of the 5th Company, 40th, standing here in reserve, immediately threw himself upon them. But his company was soon scattered in the thick forest. There remained under his control but few of his men, or of the mine throwing company stationed in the woods, and he was overwhelmed by numbers. His company, thrown into confusion, together with the 7th and 8th Companies of the 40th Regiment, was attacked flank and rear. In the ensuing bayonet battle, fought on both sides with the utmost bravery, both sides suffered great losses. The general confusion among the defenders was increased by German-speaking Americans who, in the thick woods, called out, "Wo ist das Regiment 40?" and the like, apparently for assistance. This confusion resulted in the loss of practically the entire personnel of the three companies; but few succeeded in fighting their way through. Those who did not fall in battle were taken prisoners.

The 1st Battalion of the 40th was now thrown into the counterattack. They were received by the Americans, however, with a heavy machine-gun fire, and advanced only 200 meters. Their losses were so heavy and their ranks so thinned that any further effort at counterattack seemed hopeless. The commander of the 28th Division now ordered the 2nd Battalion of the 110th Regiment, which had advanced to the region southwest of Etrépilly, to the support of the 40th Regiment. The new troops were stationed to the right of the 1st Battalion, 40th, and Captain Mencke was given command of the two battalions in the attack. He pushed forward another 200 meters, and then came to a standstill; his machine guns and mine throwers were powerless in the thick forest. His men were so exhausted by about eight o'clock in the evening that all attempts to advance were stopped. The front line was even moved back a little to get a better situation.

The brigade commander issued orders to retake the old line the next day at any cost.

The losses of the 237th Division on this day amounted to 2 officers and 28 men killed, 2 officers and 114 men wounded, and 3 officers and 82 men missing. Those of the 28th Division have not been fully established, but they amounted to about 3 officers and 151 men killed, 6 officers and 355 men wounded, and 1 officer and 53 men missing. The number of prisoners was probably somewhat greater than this.

Quiet reigned along the front of the 460th and the 461st Regiments during the forenoon of June 12. The Americans contented themselves with feeling out the positions with strong patrols.

At 5:01 P.M., however, a surprise attack was made on Belleau Woods, without artillery preparations, executed mainly by the 2nd Battalion, 5th Marines. The 1st Battalion, 461st, repulsed the enemy in the advanced positions. The 8th Company, 461st, which formed the connection between

the 40th Regiment and the 1st Battalion, 461st, also met with success. Some fifty dead lay along the front. But the neighbor on the left was not so fortunate. Soon afterward the 8th Company was completely surrounded from the left and cut off, while the 7th Company, 461st, was attacked from the rear. On the northeastern corner, also, the enemy was advancing clear through the woods.

Accordingly, Major Bischoff ordered the 2nd Battalion, 461st, to withdraw as far as Pavillon Hill, but not to give up that position under any circumstances, because it dominated the ground as far as Hill 190-Belleau-Torcy, and its loss would have necessitated the withdrawal of the entire line back of Clignon Brook.

In accordance with these orders, the left wing of the 2nd Battalion, 461st, fell back and proceeded to a counterattack toward the northeastern part of the woods, with the 5th and 7th Companies of the 461st, and the 1st and 3rd Companies of the 462nd. This attack succeeded, and the troops established themselves in the woods south of Pavillon Hill, beating off all further attacks. There was now a gap between the 461st and the 40th Regiments, which was filled by the 2nd and 4th and Machine Gun Companies of the 1st Battalion, 462nd. These units now formed the left wing of the 461st Regiment.

As there was very little firing coming from the woods at 8:00 P.M., a skirmish line reconnoitered through the forest to the northern edge of the large clearings, where they dug themselves in.

Lieutenant General von Jacobi now concentrated the entire fire of his artillery on the southern part of the woods. He also requested the commander of the 5th Guard Division, Major General von Haxthausen, to join in the fire, and detailed the 2nd Battalion, 462nd Regiment, stationed at Les Brusses Farm, to the support of the 461st Regiment.

On the front of the 28th Division, the 2nd Battalion, 110th Regiment, and parts of the 1st Battalion, 40th, had renewed the attack at 4:15 A.M. The American resistance here proved exceptionally vigorous. However, the German right wing succeeded in reaching the old line at 6:01 A.M.

A strong artillery fire began at 5:30 P.M., soon followed by attacks *en masse*. The American masses, advancing in part in columns, were subjected to a murderous fire; nevertheless they continued to throw in new forces. They succeeded in breaking through at various points. Now they appeared in the rear of the 2nd Battalion, 110th Regiment, and the 1st Battalion of the 40th. After an obstinate resistance, both battalions were forced back. Those remaining behind fought their way to the eastern edge of the woods, and then returned to the Bouresches-Belleau road, where they were incorporated into the 1st Battalion of the 110th.

Thus the bold 2nd Regiment, 5th Marines, succeeded in driving completely out of the woods the forces of the 28th Division that had established themselves there.

The losses of the 237th Division amounted to 8 men killed, 5 officers and 48 men wounded, and 1 officer and 63 men missing. Those of the 28th Division were 2 officers and 43 men killed, 1 officer and 274 men wounded, and 1 officer and 35 men missing.

The question might here suggest itself: How can it be explained that the Germans, after fighting off with unheard-of bravery continuous American attacks for seven days, should have been overwhelmed in hand-to-hand fighting in the comparatively short time of two days, as soon as the Americans had forced their way into the forest? The question is the more pertinent and the success of the Americans the more creditable because it had been common knowledge that it was precisely in hand-to-hand fighting that the German was an exceptionally redoubtable foe. It had been repeatedly demonstrated during the long course of the World War that, due to the *Furor Teutonicus* once dreaded by the Roman, the Germans were so superior to the French and the Russians in this form of combat—and what is more important, felt themselves so superior—that it was only when the French and Russians

outnumbered them that they dared meet the Germans at close quarters. The marked superiority of the German race over the Roman and Slavic races in hand-to-hand fighting impressed itself throughout the hardest battles of the World War. If the sport-loving English, and the powerful Canadians and Australians, proved to be the equals of the Germans in hand-to-hand combat, it must be remembered that like ourselves, they are of Germanic blood.

To give a complete answer to this question, we must also examine the organization and equipment of a German infantry regiment at this time. In each there was a mine thrower company of six light mine throwers; each of the three battalions had one machine gun company with eight heavy machine guns; each of the four companies of a battalion had six light machine guns. With such an organization, which was quite similar to that of the French, the German infantry possessed a great *firing force* which enabled them to beat off the American attacks. But the small number of men armed with the rifle—men with bayonets—constituted a great disadvantage once the fighting started inside the forest itself. Moreover, their shock troops had been considerably thinned out. It was quite the contrary with the Americans.

Even as it was, the equipment of the attacking divisions had been reduced before beginning the offensive, in order to give them greater shock force. During trench warfare, each infantry regiment had as many as twelve light mine throwers, twenty-four grenade throwers, and thirty-six heavy, and ninety-six light, machine guns.

There is another point. Even before the opening of the Chemin des Dames offensive, a German commanding general had seriously recommended to the High Command that each two divisions be merged into one, because he believed that the fighting strength of our infantry had been too much reduced. In the first place, the infantry regiments were weak in numbers; secondly, the number of specialists not participating in actual combat amounted to 2,000, in each division. As the specialists have smaller losses than the fighting men, the result was that after the first heavy engagements they were actually numerically greater than the infantry troops.

Now, what was the actual situation with regard to strength? The German battalions stationed opposite the American 2nd Division had suffered heavy losses since May 27. It is difficult to determine the actual losses during and after each of the daily battles. However, a good grasp of the situation may be gained from the report of the 237th Division that, on June 13, its rifle strength, exclusive of machine-gun and mine-thrower troops, was:

460th Regiment—21 officers—575 men
461st Regiment—12 officers—429 men
462nd Regiment—14 officers—478 men

In accordance with a brigade order, all available men from the transport service had been concentrated and brought to the front line. This added on the front of the 462nd Regiment a total of 1 officer, 58 non-commissioned officers, including a sergeant major, and 150 men, all of whom were urgently needed, as the 1st and 2nd Battalions of the 460th Regiment had had over 100 new cases of influenza in the last two days.

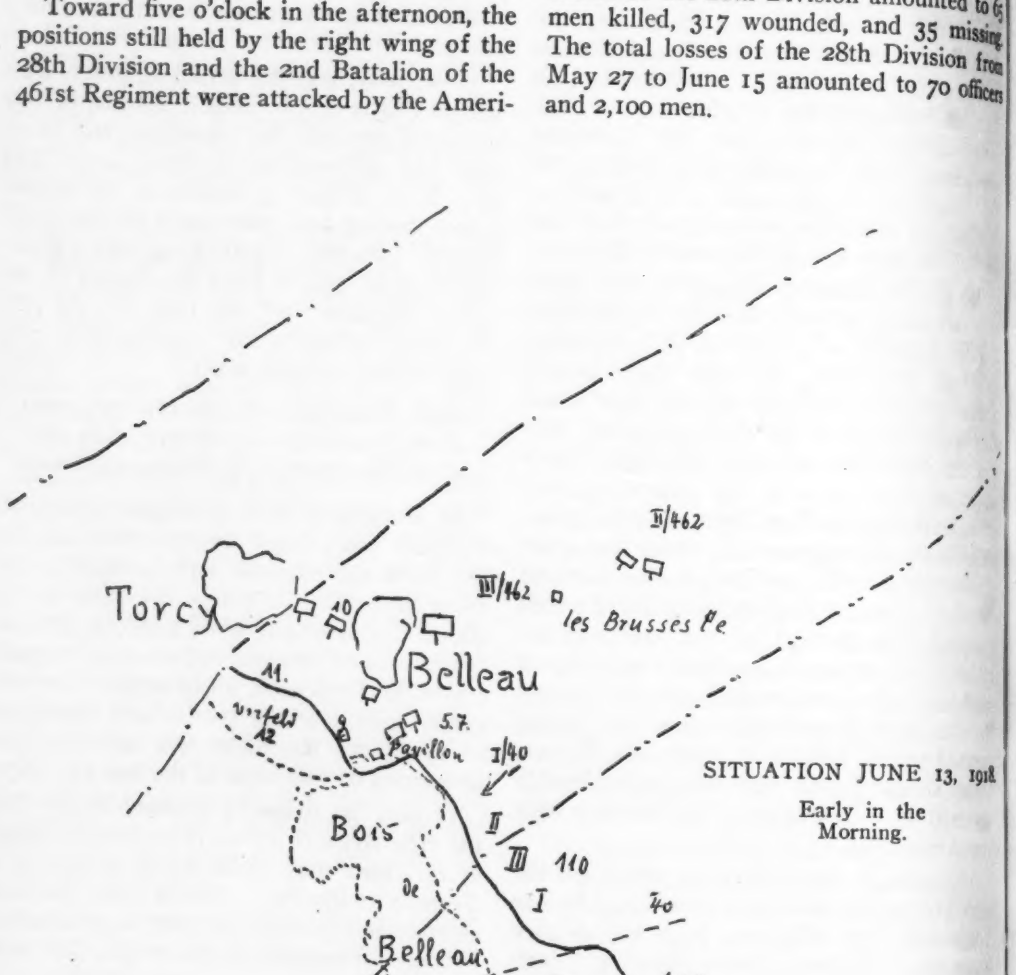
It may be assumed without doubt that the rifle strength of an American company at this time was about equal to that of a German battalion. When the German companies reported that they were attacked by superior numbers in the woods, that must actually have been the case.

On June 13, a concerted attack was planned, to be made under the commander of the 28th Division, with the object of regaining the woods and the village of Bouresches. The artillery preparations began at 4:00 A.M., and fifteen minutes later the united battalions of the 109th, 110th, and 128th Regiments began the advance; but they were soon driven back to their positions by heavy machine-gun fire from the woods and from Bouresches. Parts of the 109th Grenadier Regiment did succeed in establishing a foothold in Bouresches, where they left an outpost. As the attack

failed to progress, the 461st Regiment did not join in.

Toward five o'clock in the afternoon, the positions still held by the right wing of the 28th Division and the 2nd Battalion of the 461st Regiment were attacked by the Americans, but they did not succeed in forcing the Germans completely out of the woods. The 461st Regiment, reënforced by the 2nd Battalion, 462nd, managed to reëstablish its communications and to organize the main defense line for further resistance.

The losses of the 237th Division amounted to 4 officers and 32 men killed, 3 officers and 106 men wounded, and 9 men missing. Those of the 28th Division amounted to 65 men killed, 317 wounded, and 35 missing. The total losses of the 28th Division from May 27 to June 15 amounted to 70 officers and 2,100 men.



SITUATION JUNE 13, 1918
Early in the Morning.

The conditions existing in the 40th Regiment on June 13 were described as follows: "Due to exhaustion, malnutrition, and above all to lack of junior officers, the fighting value of these troops is practically nil."

On June 15, a gathering of American troops in the northwestern part of the woods, in front of the 237th Division, was

scattered by a withering fire. The 237th lost 1 officer and 13 men killed, and 1 officer and 60 men wounded. Major Mors, commander of the 462nd Regiment, died as a result of severe wounds received on June 6. On June 16, the gallant 237th Division was relieved by the 87th Division.

The conditions existing in the 237th Division are best described in the following extract from the diary of Lieutenant Breil, commanding the 12th Company, 461st Regiment, and in private life a head school master:

> He who escaped being wounded during the days around here may surely boast of exceptionally good fortune. But there was no time to worry about that; we were too exhausted. *What our men did here can only be judged by one who was on the scene himself.* How feeble and sick we were, with fever (the influenza), and diarrhea, all of us without exception, and yet we held out! Here we had a good example of the influence of a leader. Major Bischoff, the veteran African fighter, said to his men: "I know you are all sick. Any physician would have you put on the sick list. But will you allow the successes won with our blood to be jeopardized or even lost? A man can endure anything so long as he has the will to do so. Clench your teeth, then! Pull yourselves together! When we get out of this place we will have time to recuperate." Not a man reported himself sick.

The other divisions, the 10th and 28th, were among the finest in the German Army. As the most successful German division, the 28th (Baden) Infantry had led the attack from Chemin des Dames to the Marne, defeating and hurling back all the French who opposed its bold dash. Like the 5th Guard, this division had been relieved on the Marne in order to undertake a new task. The troops of both divisions naturally had been used up by the long-drawn-out fighting, without any intervening periods, and were sorely in need of rest.

The question might therefore be raised: Why did the German Supreme Command place these badly worn troops in the battle line, well knowing that they could not live up to their standards or their reputations? As a matter of fact, General Headquarters still had at its disposal at that time, in the army group of Crown Prince Rupprecht of Bavaria, alone, thirty-seven fully manned and fresh divisions. But it desired to use them in a decisive offensive against the English in the region of Ypres, the plan being to push their northern wing back against the sea, and to roll up their southern wing. As stated before, there was no intention of making an attack on Paris. The great offensive launched between Soissons and Reims, as well as the later attack on both sides of Reims, July 15-17, was intended as a diversion to cover this mighty so-called "Hagen" (hedging) operation. It was only as a result of the successful attack of the Allies on July 18 that the German Supreme Command was compelled to abandon that vast plan, and to use the "Hagen Divisions" for defense in other quarters.

On June 14, the Supreme Command issued orders to the army groups of the German Crown Prince to suspend the offensive, and to organize for the defensive. This put an end not only to the battles raging since June 9 on the front of the 18th Army in the region of Noyon, on the Avre and the Matz, and to the great offensive conducted by the right wing of the 7th Army west and southwest of Soissons, but also to the local attacks in the Belleau Woods region. The latter offensive could have been brought to a successful conclusion only by the use of fresh troops. The 28th Division was no longer equal to the occasion.

Thus the possession of the woods was now no longer disputed by the Germans. They became resigned to the loss. The new defensive positions held by the Conta Corps, and the advanced zone, are shown on the map, page 958.

The newly arrived 87th Division now took over the right sector of the front of the 28th Division; the latter in turn, the right sector of the front of the 231st Division. This front, on which there had been so much fighting, now became a so-called "quiet front." However, as will be seen, there was no lack of fighting here, even if it was a "quiet front."

The transfer of the positions to the 87th Division gave rise to the suggestion that

SITUATION ON JUNE 14, 1918.
8:00 A.M.
36.
3. D.
28.
2/3 145
3. D.
1/3 1953D
237. 3. D.
56 arde.
Fls.
78. R.
442
175
444
109
110
462
460
461
20
Bonnes
Vaux
Belleau
Lucy le Bocage
Bussiares
Gandelu

the northern corner of the woods be evacuated, and that the main defense line be withdrawn to the slopes behind the villages of Belleau and Torcy, to gain a stronger advanced position. In the forest itself, an advanced position could have been created only by clearing the very thick underbrush with mines. However, General von Conta did not approve this plan.

The division commander stationed the 345th Regiment on the right, and the 347th on the left. Within the woods was the 1st Battalion, 347th, less one company, which was withdrawn to Belleau village as a reserve.

We shall now take only a brief further glance at the events concerning Belleau. On the night of June 17/18 our positions in that region were attacked by infantry patrols, which were repulsed by light machine-gun fire and hand grenades. During the night of June 18/19, the enemy made a surprise attack along the entire line of the division with infantry and machine guns. At 4:50 A.M., June 20, without special artillery preparations, they attacked the front of the 347th Infantry in strong lines of skirmishers, but without success. Patrols from the 3rd Battalion, 347th, found between sixty and seventy American dead in one small area. They appeared to belong to the 7th Infantry Regiment.

On June 21, at 6:30 A.M., the enemy attacked the 11th Company, 347th Regiment, then stationed in the woods. This attack broke down close to our lines, with heavy losses to the enemy. We captured three wounded Americans of the 7th Regiment.

On June 23, between midnight and 5:00 A.M., four patrol raids in considerable force took place, the last one after artillery preparation. All were beaten off with rifle and machine-gun fire.

On June 24, they attacked at 8:00 P.M., and, after being beaten off, again at 10:15 P.M.; once more they were repulsed with heavy losses, after we had resorted to barrage fire. Commencing at about 12:30 A.M., there were sporadic raids by grenade throwers against the 1st Battalion, 347th. Simultaneously, patrols advancing on the right wing of the battalion were driven off. At 3:00 A.M., a rush against the center of the battalion was repulsed. At 4:00 A.M., the enemy again made unsuccessful attacks on the right and left wings of this battalion. In this attack the enemy crept in cautiously, with their helmets covered with green brush. French troops were now found with the Americans. Along the left wing of the battalion, the enemy was only fifty or seventy-five meters from the German lines.

The conclusive American attack took place on June 25. The divisional report was as follows:

At 5:00 P.M., a very heavy artillery fire suddenly began from Belleau and the high ground between the woods and the village. Simultaneously, medium and heavy mine throwers directed a fire on the part of the woods held by us. At 6:00 P.M., the adjoining battalions and the artillery positions also came under fire. The companies on the left, the 3rd and 4th of the 347th Regiment, stationed nearer the edge of the woods, suffered severe losses, since the mines burst for the most part in the trees.

The infantry attack began about 6:30 P.M. The battalion at first evaded the force of the blow. Captain (Cavalry) Kaulbars, commander of the battalion, was informed of the heavy losses suffered by the companies, and, at 7:00 P.M., he sent an emergency call, by radio, for the assistance of the 3rd Battalion, in reserve. He now distributed the 1st Company of shock troops among the 3rd and 4th Companies. At 7:12 P.M., division headquarters was informed by the artillery observers that the battalion was again advancing on the woods. At 7:45 P.M., observers noticed white light signals from the depth of the woods ("Here we are.") At 8:09 P.M., an artillery observer reported that the northern tip of the woods was again in our possession, and that the enemy fire had quieted down.

An infantry flier sent by the division reported that the infantry had again reached the old line.

After a short pause, a new attack was opened at 8:30 P.M. The enemy broke into our positions between the 3rd Company and what remained of the 4th. Both were rolled up against the 2nd and 5th Companies of the 2nd Battalion, adjoining them on the north. A regrouping of the massed shock troops for defense could not be effected for lack of time, particularly since at the very opening of the attack the captain of the 4th Company had been killed, and the captain of the 3rd Company mortally wounded. Those prisoners captured in our counterattack fell again into the hands of the enemy.

At 10:15 P.M., there were only remnants of

The central line shows the German positions on June 2, 1918. The broken line to the left shows the defensive positions as originally planned, which became the object of the German attack in this area. The heavy line to the right shows the German positions on June 14, after the attack by the American Second Division.

the five companies participating in the fighting. They succeeded in establishing themselves anew in positions now held along the Torcy-Belleau road.

The division had dispatched two companies of the reserve battalion of the 3rd Replacement Regiment to Belleau from the region north of Bouresches. These companies were detailed to the 347th Regiment for use on the thinned portion of its front. The 6th Company occupied the southern edge of Belleau as a measure of precaution.

The total losses of the five participating companies of the 1st and 2nd Battalions, 347th Regiment, amounted to 7 officers and 433 non-commissioned officers and men. Of these, 2 officers and 64 non-commissioned officers and men returned wounded. Therefore, there remain 5 officers and 369 non-commissioned officers and men to be classed as dead or missing. Assuming that the report from Eiffel Tower of 5 officers and 259 men prisoners is correct, 110 men must be counted dead. The 66 mentioned above as wounded were light cases, and returned to duty before the second attack. At the ratio of 1 dead to 2½ wounded, there would be a total of 275 wounded, with 209 of them either seriously wounded or lightly wounded but not recovered. On this basis we should count 264 less 209, or 55 unwounded prisoners, who must belong mainly to the five companies stationed in the western corner of the woods, and attacked in the rear.

So much for the report of Major General Feldkeller, commander of the 87th Infantry Division. Reports to the effect that part of the Americans wore German uniforms with insignia of the 109th Grenadier Regiment are no doubt mere stories. On the other hand, it is true that they sought to create confusion amidst their foe by calling out in the German language.

Belleau Woods was now entirely in the hands of the American 2nd Division. The map on page 960 shows clearly the territory gained by this division, and that gained by the French 167th Division.

To get an accurate conception of the effect produced by the first appearance of the young American troops in a pitched battle in the western theater of war, we must keep in mind both the material results attained and the moral impression produced. The two combined will give a correct picture. It is much like the effect of a well-directed artillery fire; every experienced soldier knows that often the moral effect is decidedly greater than the material.

The enormous moral impression created by the appearance of the Americans on the side of the Allied powers was dwelt upon at the beginning. In the course of my narrative, I have pointed out that the death-defying boldness of the Americans, their impetuous onslaughts, and their tenacious endurance, were well recognized by the opposing troops and produced a great impression on them.

The opinion of the commanding general of the 4th Reserve Corps, von Conta, concerning the Americans after these battles is evidenced from the following report, dated August 17, 1918:

Fighting Value: The 2nd American may be described as a very good division, and might even be considered as fit for use as shock troops. The numerous attacks by the two marine regiments in Belleau Woods were executed vigorously and without regard for the consequences. Our fire did not affect their morale sufficiently to interfere appreciably with their advance; their nerves had not yet been used up.

The replacement troops must be pronounced excellent. They are healthy, strong, physically well-developed men from eighteen to twenty-eight years of age, who only need the proper training to be turned into opponents worthy of respect.

In spirit the troops are lively and full of a grim, but good-natured, confidence. Indicative is the expression of a prisoner: "We kill or get killed."

General Ludendorff had recognized from the first reports how considerable was this new foe and how great the danger when many such fine American divisions appeared on the front. On June 8, he therefore issued the following order to all army groups on the Western Front:

American units appearing on the front should be hit particularly hard in order to render difficult the formation of an American army.

The order is significant in that it shows what a high value even the German Supreme Command set on the aid of American arms.

So it was the 2nd Division that brilliantly and deeply engraved in a glorious chapter of the history of the war the answer to the

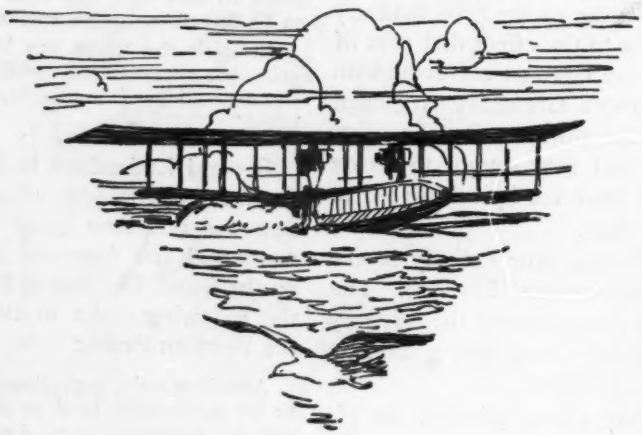
question as to how the Americans would behave in a pitched battle.*

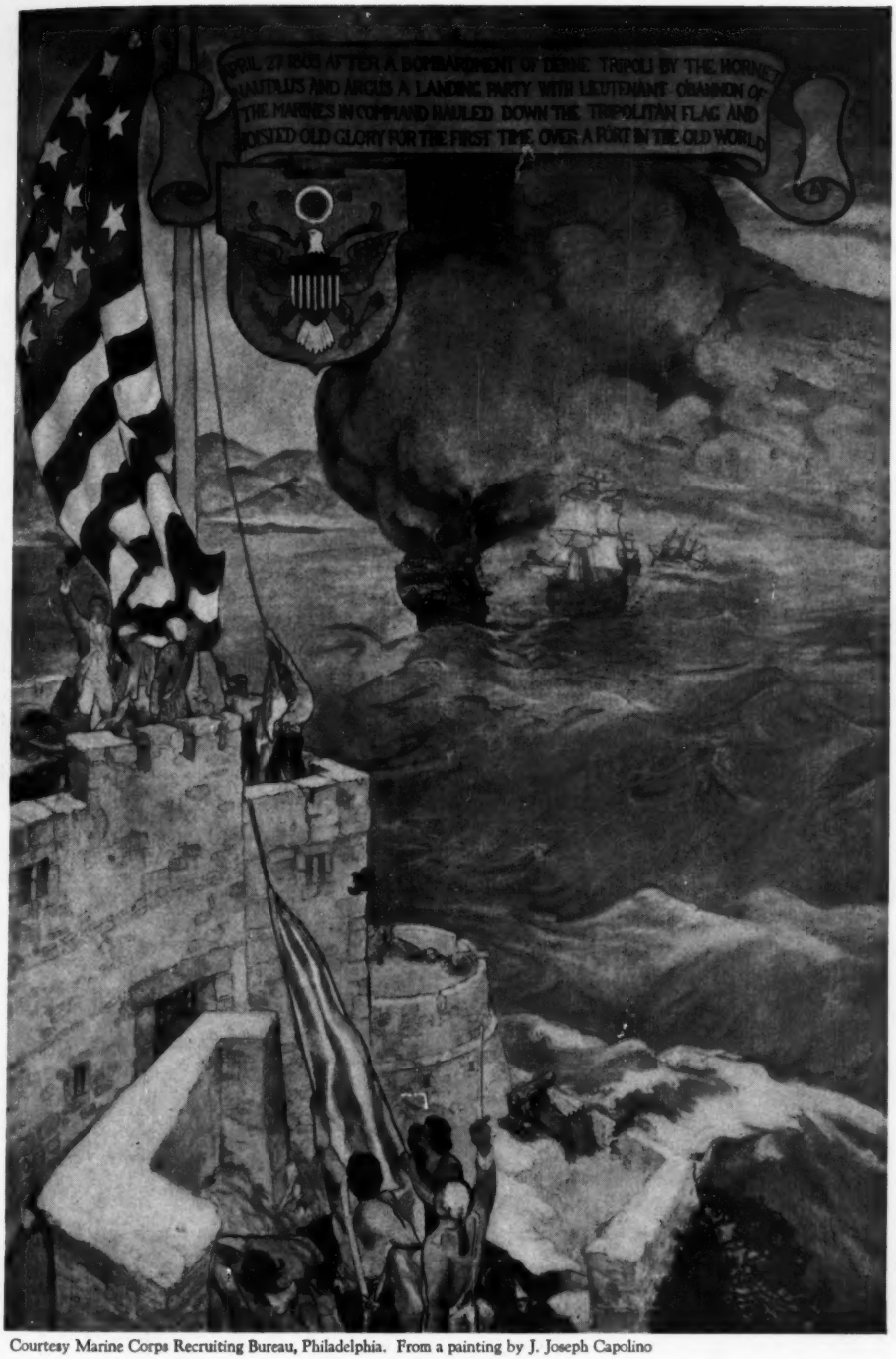
* So hat die 2 Division eine glänzende, mit ehernem Griffel in die Kriegsgeschichte eingegrabene Antwort gegeben auf die Frage, wie sich die Amerikaner im Grosskampf bewähren würden.

On the edge of the blood-drenched woods, however, we might well erect a monument draped with the French, German, and American colors, and bearing the inscription:

THESE ARE THE WOODS OF BELLEAU; IN JUNE, 1918, WRESTED FROM THE FRENCH, AFTER A BRAVE DEFENSE, BY THE GERMANS, STORMING ON IN A BOLD TWO-DAY OFFENSIVE; HEROICALLY DEFENDED BY THEM FOR NINE DAYS; THEN TAKEN BY STORM IN TWO DAYS, WITH INCOMPARABLE BRAVERY, BY THE AMERICANS, WHO REMAINED VICTORIOUSLY IN POSSESSION OF THE WOODS.

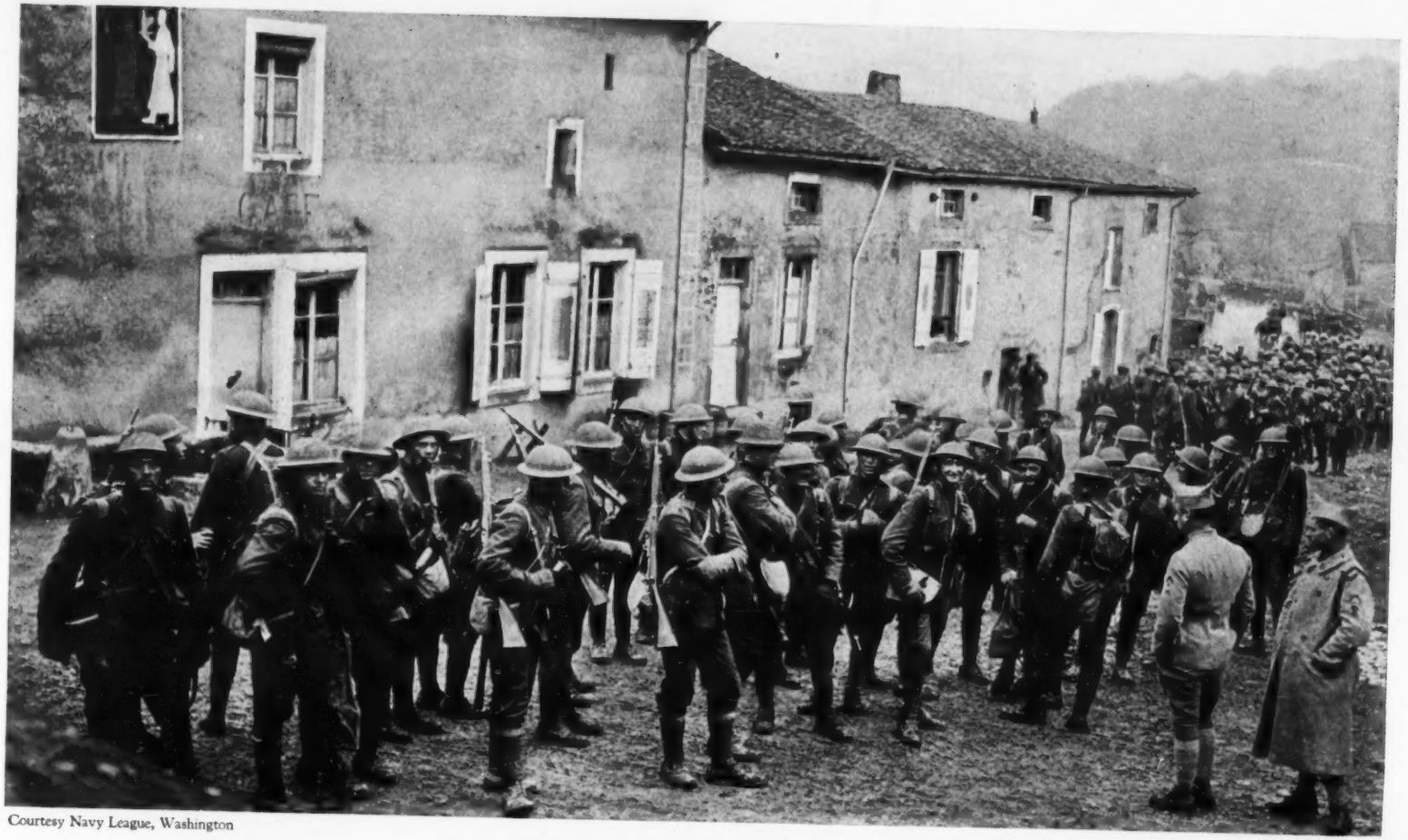
HONOR TO THE UNEXCELLED HEROES OF THE THREE NATIONS WHO, TRUE TO THEIR FATHERLAND, HERE FOUGHT AND DIED.




APRIL 27 1805 AFTER A BOMBARDMENT OF DERNE TRIPOLI BY THE HORNET
NAUTILUS AND ARGUS A LANDING PARTY WITH LIEUTENANT O'BANNON OF
THE MARINES IN COMMAND HAULED DOWN THE TRIPOLITAN FLAG AND
HOISTED OLD GLORY FOR THE FIRST TIME OVER A FORT IN THE OLD WORLD

Courtesy Marine Corps Recruiting Bureau, Philadelphia. From a painting by J. Joseph Capolino

TO THE SHORES OF TRIPOLI



Courtesy Navy League, Washington

MARINES RESTING EN ROUTE TO THE FRONT
France, ten years ago.

MARINES RESTING EN ROUTE TO THE FRONT
France, ten years ago.

Courtesy Navy League, Washington

MARINES READY TO MARCH TO FRONT
France, ten years ago.

Courtesy Navy League, Washington

MARINES RESTING AFTER LONG HIKE

MARINES RESTING AFTER LONG HIKE

Courtesy Navy League, Washington

SOUNDING THE GAS ALARM

Courtesy Navy League, Washington

MARINES RESPONDING TO GAS ALARM

MARINES RESPONDING TO GAS ALARM

Courtesy Navy League, Washington

SIGNAL STATION BELLEAU WOODS
6th Marines in France.

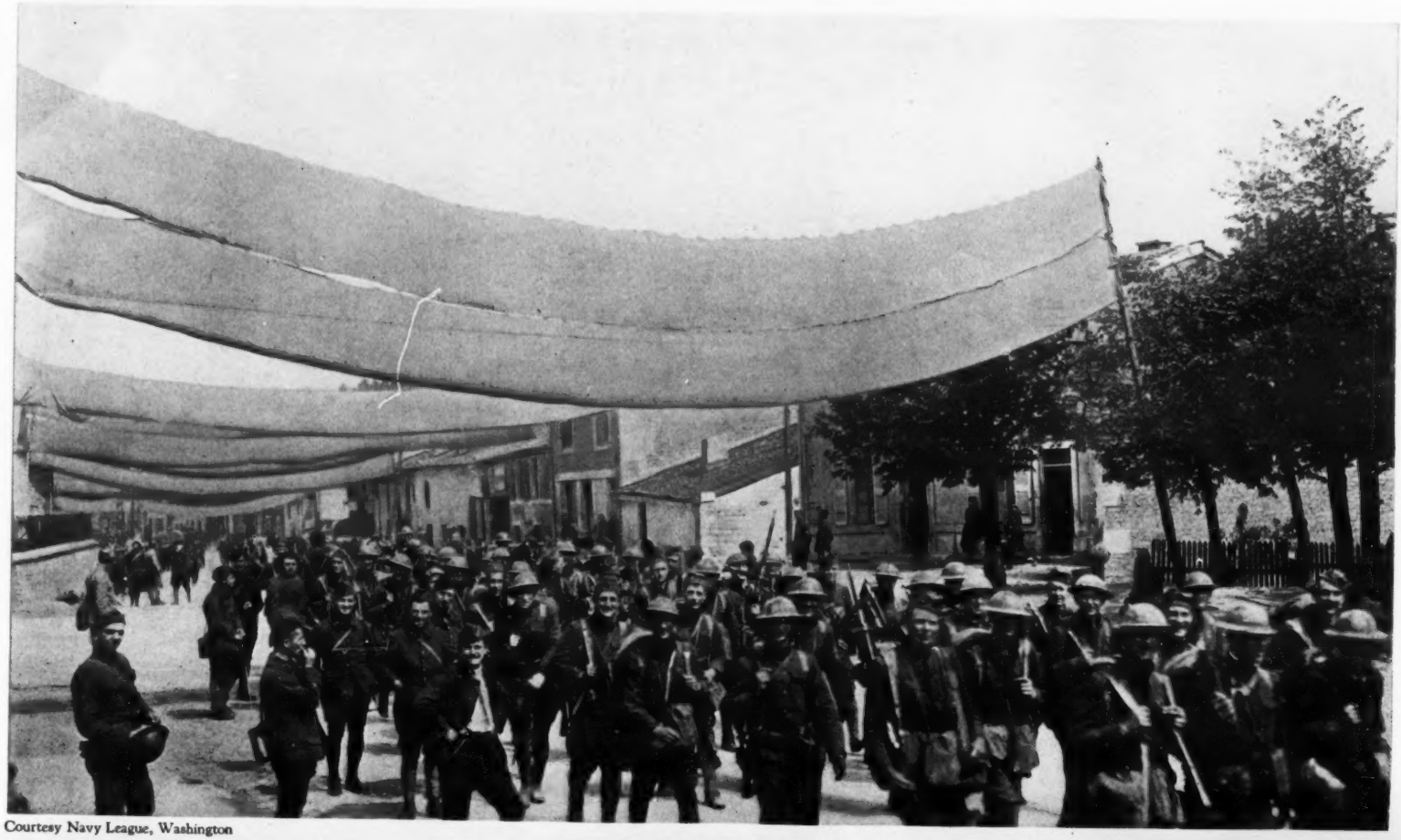
Courtesy Navy League Washington

MARINES PRACTICING WITH HAND GRENADES
France, ten years ago.

MARINES PRACTICING WITH HAND GRENADES
France, ten years ago.

Courtesy Navy League, Washington

A MARINE RECEIVING FIRST AID IN THE TRENCHES
France, ten years ago.



Courtesy Navy League, Washington

BACK FROM THE JAWS OF DEATH
Marines returning from the trenches in France.

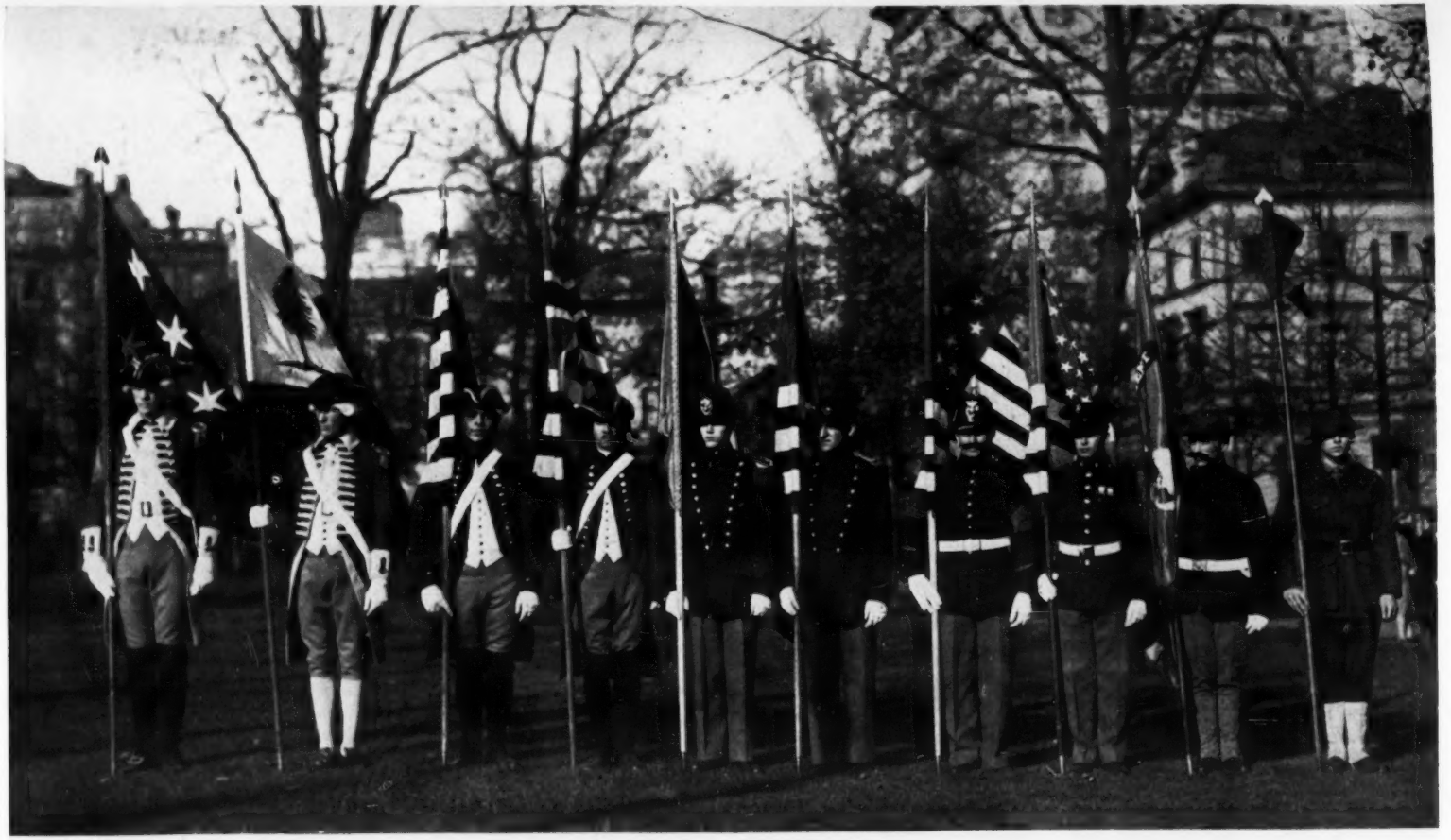
BACK FROM THE JAWS OF DEATH
Marines returning from the trenches in France.

Courtesy Navy League, Washington

RETURNING TO A BILLET FOR A WELL-EARNED REST
Marines in France ten years ago.

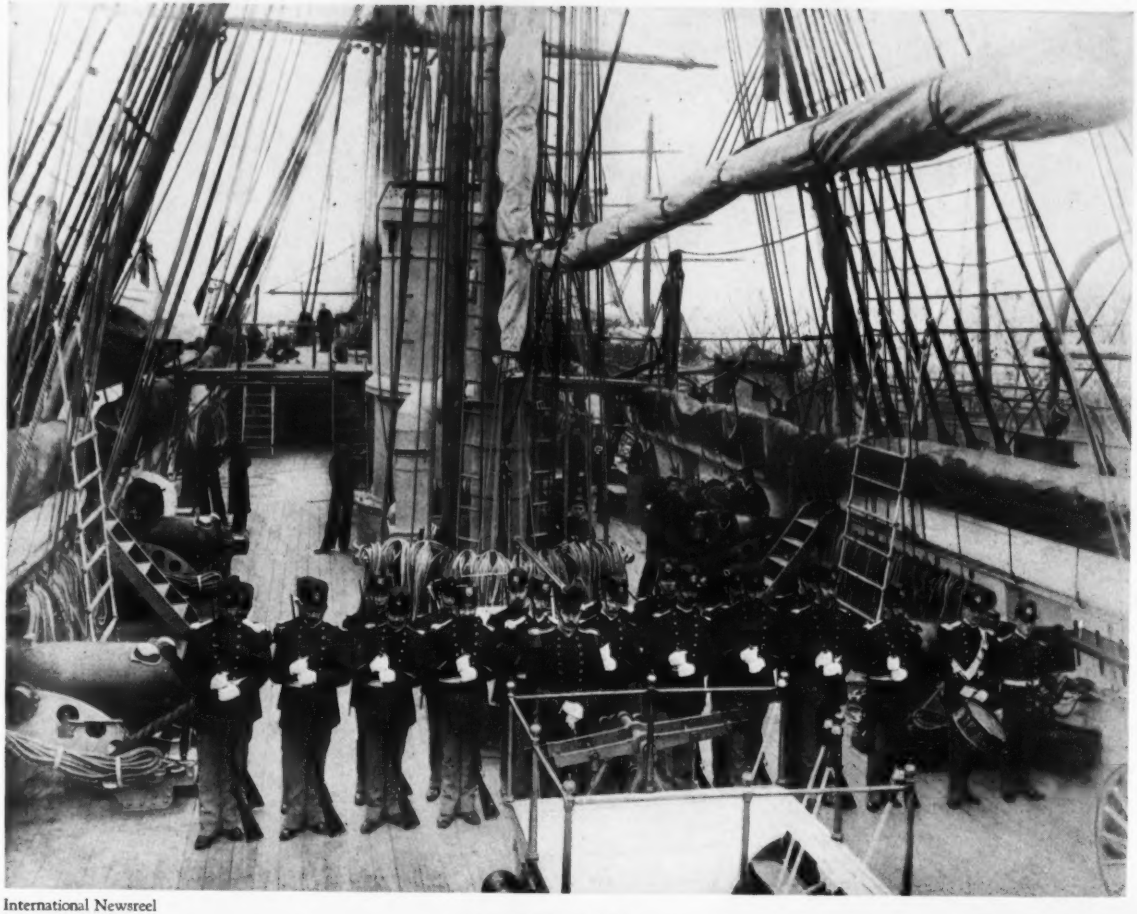
Courtesy Navy League, Washington

A MARINE MESSENGER WITH CARRIER PIGEON



International Newsreel

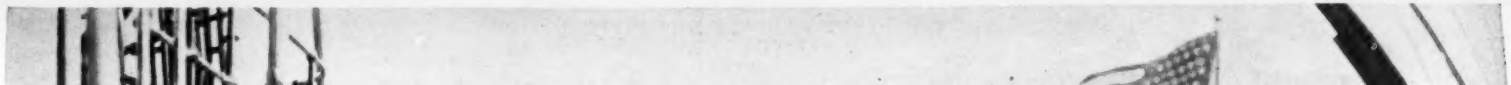
TYPES OF MARINE UNIFORM
The evolution of the Marine Corps uniform from 1775 to the present.



International Newsreel

FIFTY YEARS AGO

Marine guard of the U.S.S. *Enterprise*. Steam corvette, commissioned March 16, 1877, and first commanded by Commander George C. Remey, U. S. Navy.



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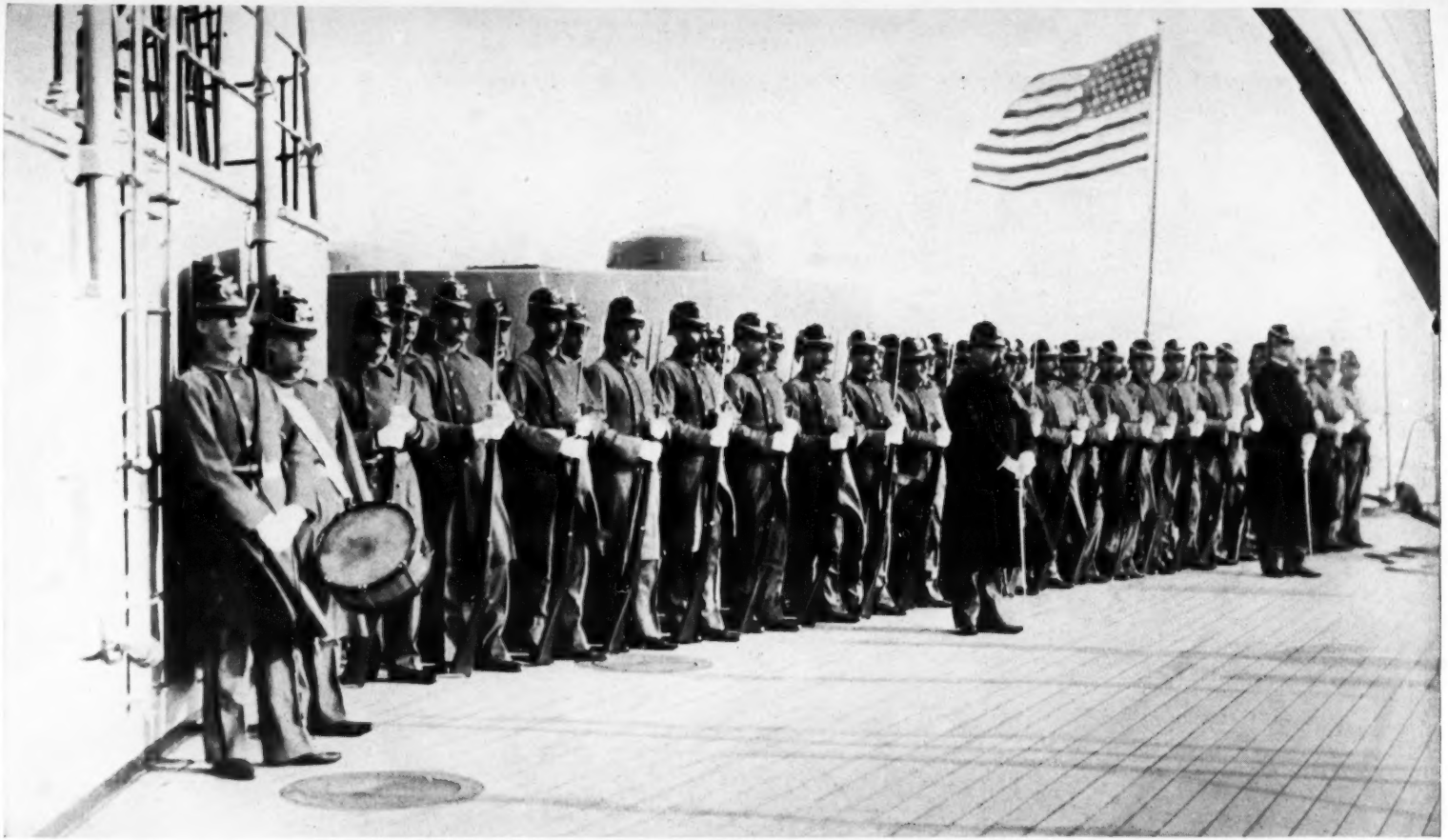
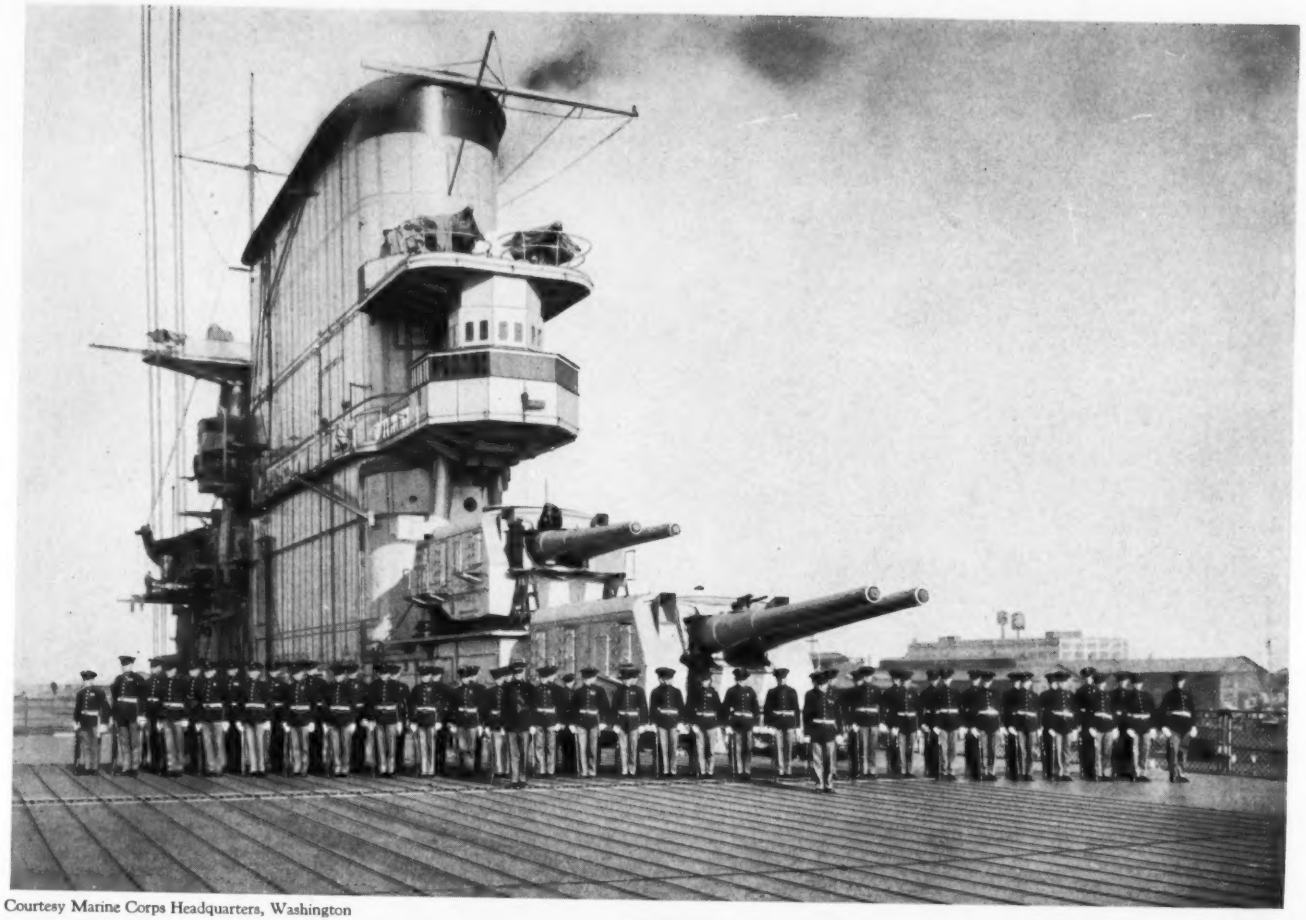


International Newsreel

THIRTY YEARS AGO

Marine guard of the U.S.S. *New York* (cruiser), now U.S.S. *Rochester*. Period about the time of the Spanish-American War



Courtesy Marine Corps Headquarters, Washington

TODAY
Marine guard of the U.S.S. *Saratoga*, 1928.

The Marine Brigade

By CAPTAIN JOHN W. THOMASON, JR., *U. S. Marine Corps*

THE war with Germany was an anonymous sort of war, fought obscurely by unnamed battalions behind a veil of censorship. In other wars, the patriotic citizenry back home, eating corn bread and enduring meatless days, might find spice for such unexciting rations in the dispatches from the front. In Rome, the plebs around the bulletin boards learned with cheers of the smart conduct of the 10th Legion, which, taken in a narrow place by swarming Gauls, rallied to the personal appeal of Caesar, broke the enemy and drove him. Paris of the Consulate was informed by the fastest post of the fortitude of the 52nd Demi-Brigade (Seine-et-Marne); it formed front to a flank under Austrian fire, and struck terribly across the bridge at Lodi; General Buonaparte considered that the 52nd Demi-Brigade (Seine-et-Marne) deserved well of the Fatherland. Englishmen drank themselves blind to the Foot Guards who held Hugomont against the battering of Ney on the flank at Waterloo, and to the 92nd Highlanders who charged, clinging to the stirrups of the Scots Greys, until the cuirassiers of Milhaud and Lobau cut them down. There are men alive today who read the flashes from Gettysburg, of the Iron Brigade of Wisconsin at Culp's Hill by Gettysburg, and of Pickett's Division that attacked on the third day in the center. Most of us remember headlines: the Rough Riders at San Juan Hill. But in our last war, the hands of the correspondents were held where their eyes were not hooded. Mr. Forbes would never have gotten the story of Balaklava past the censors, nor would Alfred, Lord Tennyson have been allowed to publish "The Charge of the Light Brigade."

In the American Expeditionary Forces there was one unit, and only one, while the Germans still held out, whose name got through the fog. This was the Brigade of Marines in the 2nd Division, U.S. Regular. The story involves certain war correspondents, so charged with suppressed news that they were near to bursting, and a chief of censors, honest and able and anxious to accommodate, but perhaps a little

TODAY
Marine guard of the U.S.S. *Saratoga*, 1928

clouded in his mind as to what marines were, and why—a condition not ever uncommon in the Army; and for two thrilling days the press of the nation clanged with the doings of 7,500 leathernecks at a place called Belleau Woods, while numerous infantry brigades, earnest and meritorious, sweated in silence, and continued so to toil.

A little later, when calmness descended,

and the instructed press was making what it could out of such sterile items as, "Yesterday the American 1st Army Corps made some progress towards the Vesle," people asked: How come these marines, anyway? We thought the Army fought on land—it did, and does. But about that Marine Brigade. . . .

Major General George Barnett was commandant of the Marine Corps. Stirred by small enterprises at Vera Cruz, in Santo Domingo, and in Haiti, the marine recruiting service had evolved the slogan, "First to Fight." Headquarters read the writing on the wall, and Headquarters realized that the marines must get into the German War or become quite ridiculous—all this aside from the sound necessity of giving marine officers experience in large operations ashore. Very early in 1917, the major general commandant had a concentration of veteran marines at Philadelphia, and others within reach. When the United States declared war against the Germans, General Barnett was able, with the fullest coöperation from Mr. Secretary Daniels, to offer to the President for service with the Army, a war-strength regiment of marines, assembled and drilling in battalions, and ready to go.

At that time, the Army was hard put to it for trained soldiers. The old regular regiments were being split into three; you had one old regiment, much diluted, and two new ones. The draft was in the air and the National Guard was recruiting up to strength. The Secretary of War was pleased to accept the proffered regiment of marines: he promised that it would sail with the very first Army contingent.

But when that contingent was made up—the infantry units which became the American 1st Division—in June of 1917, the Navy was advised that, most unfortunately, no transportation for marines existed. They would surely go in the next convoy sailing. The commandant of marines had this in a personal note from Mr. Secretary Baker, and he took it to Mr. Secretary Daniels. And General Barnett relates that it was the proudest moment in all his long career, when he informed the Secretary of War that the Army need give itself no distress about sailing accommodations for marines: he had the *Henderson*, and the *De Kalb*, and the *Von Steuben*—ex-German liners, the last two—and the Navy would see its own marines to France.

So the 5th Regiment of Marines, Colonel Doyen, sailed in the first convoy, trained for a while in France with the 1st Division, General Sibert, and was then split up variously on military police and construction details, laying the ground work for the A.E.F.

In the meantime, on September 20, 1917, the War Department approved the organization of a unit to be designated as the American 2nd Division, U.S. Regular. To it were posted the 2nd Field Artillery Brigade, the 2nd Engineers, various auxiliaries, and the 3rd Brigade of Infantry, which last was made up of the 9th and 23rd Infantry Regiments. The other infantry brigade would be formed by the major general commandant of marines, and would be known as the 4th

Brigade. General Barnett had his second regiment of marines ready: it was formed at Quantico. The 5th Regiment had been largely veteran; old-timers with all the campaign ribbons and rows of hash-marks. The new regiment, the 6th, had a seasoning of trained men, but its ranks were filled with volunteers, from college graduates to ditch-diggers. In the fall and winter of 1917 it crossed to France, and with it the nucleus of the 6th Machine Gun Battalion, Colonel Catlin commanding the 6th Marines, and Major Cole, the machine guns.

In October, 1917, the 2nd Division was directed to its designated training area in France. All its regiments were much scattered, and although General Bundy of the Army had been detailed to command, its first orders were signed by Brigadier General Doyen, of the marines, newly promoted, and senior officer present. Through the winter of 1917-18, the division assembled, coming in by battalions and companies from the jobs on which it had been dispersed. A detachment of the 5th Regiment went as far afield as Southampton, England, policing Army rest camps in that vicinity. It was February, 1918, before all the infantry of the division was together; it was March before the artillery joined, and not until May were all its elements brought under the division command. About the middle of March the 2nd Division went up to the front, taking over sectors of the Toulon-Rupt-Troyon line, between Verdun and St. Mihiel. Two American divisions, the 1st and the 26th, were on the front before it. Of all the American regular divisions, the training of the 2nd was the most haphazard and sketchy, and its assembly the most delayed. It got many of its officers and some of its "non-coms" to the service schools before it went into the line, but actually, it learned its business under fire.

From the point where the division entered the line, in that bleak, wet March of 1918, to the day in August of the next year when the marines took train for Quantico, after the parade in New York, it is very hard to set forth a separate history of the Marine Brigade, which was the 5th Regiment and the 6th Regiment and the 6th Machine Gun Battalion, and officers and men of the Navy medical corps. Its first commanding officer was General Doyen of the Marine Corps; his health failing, General Harbord of the Army relieved him. After June, 1918, it had a marine brigadier, General Neville; after Soissons, in July, the 2nd Division was commanded by a marine, General Lejeune. But its history is the history of the American 2nd Division, and they all—four regiments of infantry, three machine gun battalions, three regiments of artillery, the engineers, the signal troops, and the trains—write the same names on their battle flags.

Divisions, like regiments and companies and ships and persons, have individuality.

The 1st Division, for example, the most thoroughly trained and the oldest of the A.E.F. units, was methodical, tenacious, and steady in all its fighting. It did not move quickly; its blows were calculated and powerful and sustained. The 2nd Division was characterized by the quality of dash. No troops in any war ever reorganized more quickly, given a breathing space, than the Germans. If you stopped to bring up your services, and to adjust your communications, Heinie was at you with a counter-attack. But if you hit him and kept on hitting, he tended to disintegrate. There are three great attacks in the annals of the 2nd Division: the attack of July 18, that broke through the Forest de Retz, rolled over Chaudun and Vierzy, and stopped within

rifle shot of the vital Soissons—Château-Thierry road; the attack of October 3, that overwhelmed Blanc Mont Ridge in the Champagne so swiftly that German observers were captured in their towers, and all the German defense system to right and left paralyzed until too late to recover anything; and the strange thrust of the night of November 4, when the 3rd Brigade seized a narrow bit of German front and marched in column by a wood road, through the rainy dark, from La Nouart to Tuillerie Farm, disrupting a German corps and seizing the Beaumont ridge, so that the German organization crumbled on the whole corps

front, and the Germans fled across the Meuse. All these had a terrifying swiftness about them. And I think that the secret lies in the mixed character of the 2nd Division. United against everything outside the division, there was within it a fierce rivalry between the marines and the infantry. Looking over to the left, where the marine battalions also lay under hells of shelling, the doughboys of the 3rd Brigade considered that they could stand anything them dam' leathernecks could. Working forward under the scourge of machine-gun fire, marines of all ranks were goaded by the fear that them Army files might get ahead of them—Come on, you birds! And the careful records of German divisions attest the savage energy of these attacks; as attest also the battle maps that show advances day by day; and the casualty lists. The 2nd Division had more casualties than any other American division; in captures of prisoners and guns only the 1st Division approached it.

Napoleon rated high among the military qualities essential to success, luck. The Marine Brigade was lucky. The pure chance of battle brought it the opportunity which lifted it briefly from the anonymity of this war. Luck can do no more for any man or any brigade than bring opportunity; after that it is a matter of training, of discipline, of skill. I do not think these facts have been before set down.

At the end of May, 1918, the 2nd Division lay in the area Chaumont-en-Vexen, which is north and a little west of Paris, as you go towards Rouen, and more than a hundred kilometers from Château-Thierry. The division was to go to the area Beauvais, behind Cantigny, where the 1st Division had had an adventure, taken some mauling, and captured a town, and was due for a relief. The drive of the German 7th Army, down from the Chemin des Dames, between Reims and Soissons, to the Marne at Château-Thierry, upset these plans. The 2nd Division was ordered to the French 6th Army, then broken into pieces by the impact of von Boehn's shock divisions, and fighting desperately in the Château-Thierry area to restore the front. The division was moved by camions on the last day of May to the area Montreuil, as you go to Château-Thierry from Meaux; the infantry regiments debussed during the afternoon and night of May 31, near the town May-en-Multien, and marched towards the front. The fog of war existed very terribly on this front, that day. The French 21st Corps, General Degoutte, did not know where the front was, for the front was moving very fast, or where its own divisions were, for they were fighting bitter rear-guard actions, by companies and battalions, and being destroyed; and the German 4th Reserve Corps, having taken Château-Thierry, was swinging westward in an orderly advance, rolling up the broken French elements. Consequently, between four o'clock in the afternoon of May 31 and midnight, May 31/June 1, the 2nd Division received four sets of orders from the French corps and army command, each set locating it in a different area, as the situation changed in the eyes

of French Headquarters. The last order deployed it in the area Montreuil, between that place and Château-Thierry, astride the great Paris-Metz highway. The 2nd Division issued its own orders on this basis, locating the 3rd Brigade of Infantry to the north of the road, where it would have faced the Bois de Belleau and Hill 142 and Bouresches, and the 4th Brigade of Marines to the south, in front of Hill 204 and Vaux.

Meantime, the 9th Infantry, having marched all night with its colonel on foot at its head, came upon the Paris-Metz road soon after sunrise, June 1. The Germans were then mounting Hill 204, and to the French corps command the more immediate menace seemed from the east, from the direction of the hill. The 9th Infantry was deployed to meet it, and formed line south of the highway. The next regiment to arrive was the 6th Marines, in the afternoon. The Germans were appearing on the high ground north of the road, and the marines went into line behind the French then fighting in that direction. On these two movements, dictated by the emergency of the moment, the division line built up during the succeeding days, the 5th Marines going in on the left of the 6th Marines, and the 23rd Infantry with the 9th. Later, when the situation began to stabilize, the French corps commander considered it necessary to improve his left front, and this called for the reduction of the towns of Veuilly and Bussiares and Bouresches, and the Bois de Belleau, the last two points named being on the front of the Marine Brigade. The marines and the French 167th Division, on their left, were at this task for the rest of June, and accomplished it. The regulars of the 3rd Brigade did not have their opportunity until July 1. Then they stamped Vaux flat.

As for the German contribution to the reputation of the Marine Brigade, the Germans had seen a great deal of fighting, and they did not get excited about Belleau Woods. The mission of the German 4th Reserve Corps was to form a defensive flank for the line along the Marne, and to cover the left of a push westward toward the Ourcq. The valley of the Clignon Brook, which runs a few kilometers north of, and roughly parallel to, the Paris-Metz road, offered a suitable site for their main line, as well as a convenient covered area for the assembly of troops in the event of a decision to drive further down the Marne. This line had certain natural exits; the depression leading south from Bussiares, and the Bois de Belleau, and the point Hill 142. The Germans included these places in their outpost zone, when, in the first two days of June, they drove the French across the Clignon. The Bois de Belleau they organized and held in force. Then they sensed a stiffening in the enemy on their front, and presently identified the corpse of a 6th Marine, and on June 6, got a few prisoners from the 23rd Infantry and the Marine

Brigade. Finding Americans on their front —American regulars—they considered it desirable to thrash, thoroughly, this new opponent; to assert a moral superiority at the outset of his entry upon the war. Bussiares —Torcy—Bouresches—the Bois de Belleau, even—they were not particularly important. But it was important to beat the Americans, and German division commanders so advised their troops. It followed that for a little space the attention of the world was centered on a few square kilometers of blood-soaked woodland, and it was the fortune of the Marine Brigade to answer the question: Will these Yankees fight? And it is recorded that they answered it.

Thereafter, the Marine Brigade did not emerge from the dispatches as a unit. The 2nd Division continued to have opportunities. It was one of the three divisions—the others were the American 1st Division and the Moroccan 1st Division—that attacked south of Soissons on July 18; and that day the war was lost to the Central Empires. It went to Gouraud in the Champagne, at the end of September, where the Germans held firm in the massif Notre Dame des Champs, and pierced that place in one of the great, clean-cut assaults of the war. It drove up from the Argonne to the Meuse in November. with the Americans; the last night of the war the Marine Brigade got men perilously across the Meuse and was attacking when the Armistice fell. It marched to Germany and it came home in August of the next year, and disbanded. It so fell out that all its opportunities were conspicuous. It came upon the front at critical times. Great events hinged upon its attacks. Much of that was chance; the A.E.F. had several divisions that would have done well anywhere. But there was nothing of luck—there was cold, hard discipline, and much war-wisdom, learned under the guns, and sheer, clean skill, in the fighting which made these opportunities good.

These things came at a price. Statistics are not interesting; the butcher's bill of the American 2nd Division will compare cruelly and honorably, for the five months it was engaged, with that of any division in any Army in the war. The casualties of the Marine Brigade were nearer two hundred than one hundred per cent. Such things carry little meaning except to men who can remember the dreadful wheat field to the west of Belleau Woods, and shrapnel-flailed slopes betweeen Blanc Mont and St. Etienne, and the line of dead engineers on the path between the heights of the Meuse near Pouilly and the place where the bridge was, that last night of the war.

For the rest, there is transmitted a certain old blood-stained glory, peculiarly of the marines and of the United States naval service. That was the Marine Brigade.

Why Quantico?

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RESEARCHES in this direction took me first into the files at Quantico because, when this paper was started, I was serving as chief of staff to the commanding general of the post. But these files began in the middle, as it were, and contained nothing of the reasons that necessarily preceded the acquisition of so large a territory. I had been under a dim impression that Quantico was a sort of orphan of the Great War, one of the countless military reservations once the scene of intense activity, but later fallen on evil days. There must, however, have been reasons for the accumulations of ordnance and equipment, apparatus of varied nature, and materials suitable for emergencies other than those of the war itself. Although much of the material was acquired from the Army, the atmosphere of the ensemble is distinctly nautical, a condition that is enhanced by the bell of the old *Kentucky*, which is struck at regular intervals by the watch on the dock. Back of Quantico there must be something other than the Great War, something that antedates that war by many years, since its influence so strongly dominates all activities.

Wherever marines are gathered together there is one word that is in monotonous repetition; it is "expedition." Every story is based on "When we were in Chinaragua," or "Down in Dominiama." The posts are filled with "expeditionary widows," and the storehouses with "expeditionary equipment." This last-named includes quantities of something we used to hear more of—"advanced base material"—and Quantico abounds with huge sheds of it, all carefully preserved against the time "when the men come back."

In order, therefore, to arrive at the reasons for Quantico, or for any place of similar nature, it early became necessary to locate files that antedated anything of a local nature, that revealed the chain of thought actuating the assembly of those things that Quantico now provides. Headquarters of the Marine Corps contains itemized information relative to costs, estimates of strength, weights of ordnance and equipment together with their dimensions, capacity of storehouses, etc., but there is a lack of the early military planning that inspired these things. It is shown *what* everything is, but not *why* it is. However, the files in headquarters indicated a single origin; all inquiries and orders originated with the General Board of the Navy. So there, evidently, lay the source of information.

Many hours spent in searching through the files of the General Board have convinced me that that body alone is responsible for the concentration of men and material into homogeneous units of organization, which, in ordinary conditions, are ready to move instantly *as units*, either on routine expeditionary duty, or to establish an overseas base for the fleet. Quantico centralizes those scattered and disunited elements that were once the subject of much adverse criticism, and accomplishes the long and repeated recommendations of the General Board. Without going into "dead files," I will outline the chain of military thought actuating the General Board "from the beginning of its existence," as Admiral Dewey said in an official letter to the Secretary of the Navy.

During the winter of 1902-3 a part of the maneuvers in the Caribbean Sea consisted of establishing an advanced base on the island of Culebra. It was the first thing of its kind many of us had seen, and involved dragging heavy ordnance up a hill, building gun emplacements and—what was worse than anything else—locating equipment and getting it from ship to shore. It

was all accomplished in time, though, "by sheer strength and awkwardness" as Captain C. S. Kempff graphically describes such efforts. On April 10, 1903, Lieutenant H. K. Benham, U. S. Navy, submitted a report from the *Olympia* to the commander of the Caribbean Squadron, which throws the first spotlight on conditions destined to result in the establishment of Quantico. He criticized the loading of the collier *Sterling*, which "represented a ship sent along with a fleet carrying all materials for the establishment of an advanced base. The unloading and installation of this material ashore were to simulate as nearly as possible the conditions of actual war and it is with these ideas that I give what I consider are faults discovered and their remedies." There followed a long list of faults, such as no detailed list of cargo, no way of locating items in cargo, boxes broken and unmarked. He urged that the officer who supervises loading should accompany a cargo to supervise its unloading. "Of course most of these criticisms are deduced from the absence of such measures in the case of the *Sterling*." On this letter Rear Admiral J. B. Coghlan endorsed: "I invite careful attention to the within report as the correction of the defects noted is necessary to success in any expeditionary work. Though every effort was made to expedite the unloading of the *Sterling*, it took about a month to do so." This report and its endorsements eventually reached the commandant of the Norfolk navy yard, where the *Sterling* had been loaded, and that officer's twenty-fourth endorsement, dated June 24, 1903, throws so much light on the situation that I must quote its third paragraph in full:

> The *Sterling* arrived at Lambert's Point October 10, 1902 and, after being partly loaded with coal, sailed for Boston on October 19. There several anchors and mooring buoys and a fifteen-ton derrick were placed on board, and the *Sterling* came to the Norfolk Navy Yard on November 10. Under urgent orders, the General Storekeeper delivered to the *Sterling* all the stores which had been accumulated by him, and sent a working party to assist in stowing the cargo on board. A memorandum invoice of such stores was furnished to the Master. The Ordnance officer placed ordnance stores on board by another working party. Some of the stores came from Washington, New York, Newport, Rock Island, and Frankfort, part of which was transferred from the railroad car to the *Sterling*. The shipment from this Yard included guns, ammunition, ordnance material and broken stone, and cement and sand. A list of the ordnance material was given the General Storekeeper. The officer commanding Marines at this Navy Yard placed on board the *Sterling* a considerable amount of equipage, building materials, provisions, stores, lists of which were forwarded by him to the Commanding Officer of the Marine Regiment at Culebra. It appears from the partial but voluminous lists of stores loaded by the *Sterling* that the cargo of the *Sterling* was a full and most varied one. The cargo was boxed and suitably prepared for shipment; the cargo was stowed by three gangs of men from the Navy Yard, and the Master of the *Sterling* had supervision of the spaces for stowage, and the way of stowing. He objected to receiving a large shipment by the Marine officer of unslacked lime, and there is other evidence that he exercised some control of the stowage, as it was his duty to do. Nevertheless it does not appear that he was advised in advance of all the cargo to be received, or that he or any other officer planned the stowage of the vessel according to previous advices, but that it was done as the shipments were received, sometimes by more than one working party, up to the day of sailing. Whatever difficulties occurred in unloading the *Sterling*, from the different points of unloading, nothing was known here of the exact destination of each shipment. The cargo was stowed as if it was all to be discharged at one place and time. The loading was not in charge of any one officer who was fully advised of all the items of intended shipment, and the destination of each item in time to prepare plans of stowage, with the knowledge of an expert in the art of loading a vessel for a distant sea voyage.

The situation just described explains the letter of Lieutenant Benham and the vigorous endorsement of the commander of the Caribbean Squadron; it also paves the way for the consistent attitude of the General Board.

On September 30, 1904, the General Board requested the Secretary of the Navy to require commandants of navy yards and stations to submit regular reports showing supplies of advanced base materials on hand, in order that "the General Board may have information, kept up to date, of the kind, quantity, and condition of the material on hand for that purpose." Passing over most of the correspondence of a similar nature, in which the General Board insisted on having knowledge of what was being accomplished, and upon the assembly of *men and material in one place* for instructional purposes, we find that on September 30, 1905, the Secretary was informed that certain estimates had been received from the bureaus of ordnance and equipment concerning size and floor space of buildings for advanced base outfits, one on the Atlantic coast and the other at Subig Bay, and it

requested "similar information from the Commandant of the Marine Corps," stating:

> It must be borne in mind that an expeditionary force dispatched at the outbreak of war to seize and defend an advanced base, would probably be composed wholly of Marines. In other words, the ordnance and equipment, including guns, portable platforms, searchlights, mines, etc.,—as well as the Marines' stores proper—would be used by Marines, and under the supervision of Marine officers. It would seem to the General Board best to have the advanced base outfits complete, stored together in one building. The advantage of having such an outfit ready beforehand, for use in time of need, is obvious.

In handling correspondence of this nature care must be exercised not to quote certain parts, or even words, but the average officer can read between the lines and supply satisfactory localities for such as have been purposely omitted. The following from a letter of February 3, 1905, is, therefore, allowable:

> But besides . . . . the main base of the fleet in . . . . all the war plans made by the General Board demand an advanced base of operations, the precise location, defense, and time of occupation of which depend upon the circumstances of the particular campaign. In some combined operations the plans prescribe that the advanced base shall be seized and held by the Navy and Marines until relieved by the Army; in others the Navy alone will have to defend it. *From the beginning of its existence the General Board has endeavored to have this material assembled and reserved for that specific purpose.* [My italics.]

The General Board had adhered to its point "from the beginning of its existence," and it is noted that the issue is for the assembly of material and men, to the end that a fiasco similar to that of the *Sterling* should not be repeated, or accepted as a satisfactory criterion for maneuvers. But it is also noted that the conception of the General Board has thus far not included space—*acreage—for training.* The idea seems to have been limited to guns, mounts, searchlights, mines, torpedoes, and kindred apparatus for defense against the sea, to the exclusion of at least an equally important defense towards the land. This latter would require the employment of considerable infantry, artillery, equipment for field engineering, mobile transportation for all, and the paraphernalia for their operation. All of this requires space, acreage of diversified terrain, for training of infantry, artillery, engineers, etc., *in addition* to water facilities necessary for mines, torpedoes, and gunnery, and thus far the developments of the General Board (and of everybody else) had not planned for this.

The Secretary of the Navy evidently considered the foregoing letter of considerable importance, because on the sixth and eighth of the same month he addressed identical letters to the chairmen of the House and the Senate naval committees, in which he discussed the materials necessary for advanced base outfits, and stated: "In such a campaign . . . . would be the primary base in. . . . . If the scene of hostilities should be at any distance from . . . . , as, for example, in the vicinity of . . . . , the movements of the fleet would be greatly restricted if obliged to tie to this primary base for all purposes." Following this there is much correspondence with the departments of the Marine Corps, relating to stores and equipment for advanced base use, and the Naval War College wrote for information relative to the "number of marines, guns, mines, vessels, and other materials," stating this was needed for certain of its plans.

Only enough documents are being cited to show continuity in the development of this idea. In a letter to the Secretary of the Navy dated June 21, 1905, previous recommendations are reiterated, "that two complete outfits for the establishment of an advanced base be assembled at once and held in reserve for this purpose. These outfits would also be available for the use of an expeditionary force of any nature whatever, in case of an emergency such as might necessitate the departure and landing of Marines at some distant point in the shortest possible time." With penetrating insight into the future, the General Board here introduced another element into the anticipated work of this force: "These outfits would also be available for the use of an expeditionary force *of any nature whatever.* . . . ." This provides for the personnel leaving its heavy equipment and departing on short notice for service as infantry, for that kind of hurried expeditionary duty that the marines look upon as routine. One would have supposed that some of these plans had originated among the marines themselves, or in their headquarters, but there is nothing to show this to be the case; the entire inception seems to lie within the General Board, and there was no marine member of that body at that

time. The Marine Corps was without representation on the General Board from the retirement of Colonel Reid in 1904 until the appointment of General Barnett in 1915.

It is apparent that the efforts of the General Board were meeting with some response. On June 21, 1905, the Department directed "that the following material, in addition to that already ordered, coming under the cognizance of the bureau of ordnance, be provided and placed in reserve for the use of an expeditionary force, or for use in the establishment of an advanced base in time of war." There followed a list of guns and their appurtenances. A few days later the Department directed the bureau of yards and docks to build certain storehouses for this reserve equipment.

Continuing with its theme the General Board wrote on January 25, 1906, as follows: "In the plans for occupation of advanced bases . . . . the men for establishing and manning the shore defenses are planned to be Marines taken from shore so that the complement of no ship shall be reduced." At a later date the recommendations were repeated with emphasis, and on August 3, 1906, the bureau of equipment prepared a lengthy memorandum relative to what it was supposed to furnish. That matters were not progressing satisfactorily is evident from a letter dated September 6, 1907, in which the president of the General Board stated to the Secretary of the Navy: "The General Board has since its earliest days, at various times invited the attention of the Department to the importance of having in reserve certain materials which will be necessary for the establishment of advanced bases in time of war, or for use in case of certain emergencies." Resulting from this the Secretary of the Navy directed the commandant of the Marine Corps to "include in your estimate . . . . an amount sufficient to insure provision for two entire outfits of Marine equipment for use in special emergencies in accordance with lists forwarded . . . ." A similar letter was sent to the bureau of yards and docks on the same day.

About this time certain officers advanced a proposal to equip both the Army and the Navy proper with similar advanced base outfits, to be used by whichever happened to need it at the time, and in case of later transfer of duty from one service to the other to compensate by exchange of outfits. This was referred to the bureau of ordnance, the chief of which wrote the General Board as follows:

> With the present complement of the Marine Corps it is believed that there will be no difficulty in finding men enough to man all the guns for an advanced base outfit that the Bureau of Ordnance will be able to supply, and the probability of their having to be relieved and turn their weapons over to the Army is too remote to justify a large expenditure of Naval appropriation funds in a class of weapons that is not peculiar to Naval service and could not be efficiently used by its personnel in time of emergency.

On May 28, 1909, the Department sent identical letters to the commandants of four stations to inspect and inventory advanced base equipment and report the result to the General Board. There was a good deal of academic discussion among Army and Navy officers attending the war colleges as to which arm should assume responsibility for this class of work, and the subject was settled by the General Board again, whose president wrote the Secretary of the Navy, on January 31, 1910: "That the advanced base material be assembled at Philadelphia, and that the advanced base outfit in the Asiatic and Pacific stations be assembled at Olongapo, and that the custody of this material, the responsibility for its maintenance in good condition and readiness be imposed upon the Marine Corps, and that the naval division of inspections be charged with its inspection." And again: "That the commandant of the Marine Corps be instructed to prepare for the care and custody of advanced base material and to take the necessary steps to instruct the officers and men under his command in the use of this material." Upon this the Secretary endorsed to the commandant of the Marine Corps: "The Department has approved the within recommendations and desires to put them into effect as soon as practicable. Please inform the Department if the Marine Corps is ready to assume the part assigned to it. If not ready, please report what preliminary steps are necessary and how much time will probably be required." On March 24, 1910, formal orders to accomplish this were issued to the major general commandant, and to the commandants at Norfolk, Philadelphia, Olongapo, and to the aid for inspections. Thus we see that, after many years of effort on the part of the General

Board, both men and material were partly assembled in two places where suitable buildings had been prepared, where everything was at hand, except the one item so vitally needed, *acreage of diversified terrain for training.*

There is now a gap of three years in the files, during which the "outfits" were training and drilling as anticipated by the General Board. But the subject was not forgotten, as evidenced by a letter to the Secretary on January 24, 1913, and the following to the commandant of the Marine Corps four days later: "There is forwarded herewith for your information and such comment as you may wish to make, a proposed letter on the subject of advanced bases drawn up by the General Board. Should you so desire, the General Board will be pleased to have you attend any of its meetings on Tuesdays or Fridays for the purpose of presenting your views. In this case it is suggested that the officer immediately in charge of advanced base outfits appear before the Board with you at such time." It is here noted, with a curious interest, that this is the first time the commandant of the Marine Corps had been consulted in this matter, beyond having been called on to supply information relative to storage spaces. It is also noted that the materials that had been supplied were not satisfactory to the General Board, and after enlarging upon the necessity of modern ordnance and equipment, it recommended: "That the Marine fixed defense regiment charged with the care of this outfit be exercised in actual landing, and placing it on shore at a point selected for an advanced base in connection with maneuvers with the Atlantic Fleet, and that all advanced base guns so placed be exercised at target practice." On the same day the Department approved these recommendations and directed the commandant of the Marine Corps to prepare for the maneuvers.

From the letters that follow it is evident that there was a lack of coördination in the complex duties that were involved. In preparing for the expected maneuvers the Department addressed a communication to the commanding officer of the U.S.S. *Prairie,* asking "whether the *Prairie* can carry the outfit described in the 7th paragraph of the Major General Commandant's letter, the weight of which is given in the 4th endorsement, and technical description in the 3rd endorsement." Evidently this information was not included in the original correspondence, and when supplied by later endorsement nobody knew whether the ship being considered could carry it! On April 10, 1913, the commandant of the Marine Corps wrote a letter discussing the forthcoming maneuvers, and enclosed tables of weights, measurements, and personnel, which goes to show that the consolidation striven for by the General Board had not been attained, as there was lack of preparatory staff work.

The navy yard at Philadelphia had been designated as headquarters for these activities on the Atlantic coast, and much had been done there, but reports made by the board of inspection on April 19, 1913, show that facilities were still inadequate.

As a result of the maneuvers held in January, 1914, the General Board wrote: "The results are gratifying, and the General Board recommends that these advanced base exercises be held each year as a matter of routine training, etc." The question of exercising a full brigade was under discussion, and on February 20, 1914, the commander-in-chief of the Atlantic Fleet wrote the Secretary of the Navy:

> The Commander-in-Chief is not prepared to recommend approval of Captain Sims' plan for permanently stationing at . . . . a Brigade of Marines, and a number of torpedo boats and submarines. Unless a force is permanently stationed at . . . . however, it is essential that the advanced base brigade should be *permanently organized,* with its outfits and stores complete, and ready to embark in the shortest possible time. On the outbreak of war no time will be allowed for mobilizing this force and preparing it for service. It must be constantly maintained on a war footing.

The foregoing referred to the necessity of gathering forces from many places in order to organize an entire expedition. Certain technical units were in readiness at Philadelphia, where the equipment was stored, but many of the men and officers had to be assembled at the point of embarkation, all unknown to each other and to their work. The plans of the General Board for maneuvers during the winter 1914-15 were impossible of execution owing to "the employment of such large forces of Marines in Haiti."

The files of the General Board come to an abrupt end about this point; but those

of the headquarters of the Marine Corps begin immediately—General Barnett was appointed a member of the General Board on June 2, 1915—and these show that the thoughts and plans of the General Board have been consistently developed and executed. The report of the major general commandant to the Secretary of the Navy for the fiscal year 1915 contained the following:

> Based on the experience gained from many expeditions, I am strongly of the opinion that a mobile force of not less than 3,500 men should be maintained on this coast, and one of not less than 1,200 men on the west coast. These forces would also be in readiness at all times for service as a part of the garrison of advanced bases, acting as supports to the fixed defense force by protecting the base from hostile landing forces. This duty is of very great importance, as fortified harbors are very vulnerable to this form of attack. In order that Infantry and Artillery organizations may receive the absolutely essential instruction in the duties they will be called upon to perform in the field, it is necessary that maneuver grounds be provided for their use. All of the Marine Corps posts being situated in or near large cities, afford no such facilities. . . . . If the maneuver grounds above mentioned be provided, a camp of instruction could be held each year, and a valuable course of training given in field exercises, combat firing, maneuvers, target practice with artillery, small arms and machine guns.

In his annual report for the fiscal year 1916, the major general commandant enlarged upon this topic, and said: "The establishment, therefore, of a large Marine Corps post on each coast, as training stations for its expeditionary forces, has now become the paramount need of the Marine Corps." And later: "Initial steps to supply the need of the Corps for a large post on the west coast were taken at the last session of Congress. . . . . It is of vital importance to the efficiency of the Marine Corps that a similar post on the east coast should be provided and equipped." Quoting from the hearings before the House committee on naval affairs on May 14, 1928:

> The establishment of a Marine Corps Base, as recommended by the Major General Commandant in his annual reports for the fiscal years 1915 and 1916, was approved in principle, by the then Secretary of the Navy, but no definite action was taken toward the establishment of such a base until the outbreak of the World War. Upon the outbreak of the war it became immediately necessary for provision to be made for training of officers and enlisted men of the Marine Corps. Steps were immediately taken to find a site for the establishment of a training station . . . . . After study of various sites by a board of officers, Quantico was recommended.

Continuing with the hearings before the committee on naval affairs on May 14, 1928, the commandant of the Marine Corps stated:

> The necessity for the maintenance of a station where the various units making up an expeditionary force of Marines could be properly trained for modern warfare being recognized, the Congress of the United States, in the act making appropriations for the Naval Service for the fiscal year ending June 30, 1919, authorized the acquisition of the land, which now constitutes the Marine Corps reservation at Quantico, for use as a permanent Marine Corps post, and appropriated the necessary money for payment of the land. The following language is quoted from this act:
>
> "The President is authorized to acquire under the authority and provisions of the act all of the land specified in the report of the Board appointed by the Major General Commandant, Marine Corps, dated January 25, 1918, at Quantico, Virginia, as a permanent Marine Corps post, and the sum of $475,000, or so much thereof as may be necessary, is hereby appropriated for this purpose."

During the hearings conducted on May 14, 1928, the commandant of the Marine Corps pointed out and emphasized those items that had been so persistently advocated by the General Board, and he outlined the work of the Marine Corps as that work had been foreseen and planned. In company with the chief of the bureau of yards and docks he described the physical requirements of a base, its necessary appurtenances and equipment, and asked for funds with which to maintain the establishment. He said:

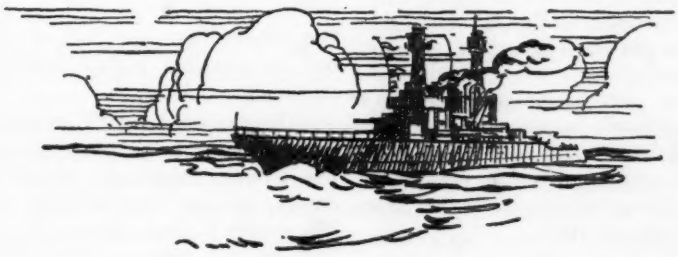
> I may say, briefly, that the Marine Corps maintains an organized expeditionary force under training, and it is ready for any emergency that may arise. Such emergencies come frequently and quickly, so that in order to carry out promptly and efficiently the duty assigned to the Marine Corps, it is necessary not only for training to be in readiness for war, which is the duty of all military and naval organizations, but in order to be in readiness for the duties of peace, these forces should be kept under training for any emergency. That expeditionary force for the east coast is stationed at Quantico, so that we maintain there normally, exclusive of aviation personnel, something more than 3,500 men.

The "duty assigned to the Marine Corps," mentioned just above, undoubtedly refers to the recommendations of the General Board, dated January 31, 1910, which were approved by the Secretary of the Navy on March 24, 1910. And "the duties of peace" probably refer to mail guards and to cer-

tain kinds of expeditions. The fact that Quantico is now depleted of personnel is not a criterion, because the depletion was caused by executing the very functions for which the post was created. Men and material have been ultimately concentrated in one place, which place is suitable for their concentration, just as outlined by the General Board on repeated occasions. Just how well Quantico has fulfilled the functions expected of it is another story. Omitting the activities of the World War, for which such a base was never planned, it is enough to say that since that event expeditionary forces have been admirably trained and sent out on serious missions to many lands. There have been two "overseas" maneuvers in conjunction with the fleet, one in the Caribbean Sea and one in the Hawaiian Islands, and there have been two episodes of guarding the federal mail at the request of the Post Office Department.

In all of this Quantico has been the chief base, sharing the brunt with the less extensive base at San Diego. The spirit of the General Board's aspiration has been carried out to the letter, when it urged, on June 21, 1905, "that two complete outfits of an advanced base be assembled at once and held in reserve for this purpose. These outfits would also be available for the use of an expeditionary force of *any nature whatever,* in case of emergency such as might necessitate the departure and landing of Marines at some distant point in the shortest possible time." [My italics.]

These are the derivations and functions of some fifty-five hundred acres of varied topography that happen to be named "Quantico," where an expeditionary force is normally "permanently organized, with its outfits and stores complete, and ready to embark in the shortest possible time," as expressed by the commander-in-chief of the Atlantic Fleet.



A Naval Research Reserve

By CAPTAIN C. S. MCDOWELL, *U. S. Navy*

IT IS my purpose in this article to show the desirability of linking up some of the best scientific minds of the country with the Navy and the Navy's problems, so that these scientists will form a reserve available for use when required.

Research consists of searching out, correlating and classifying knowledge. Research to be of value to the Navy must have its results disseminated among the officers of the service, so that it may be intelligently applied.

It may be stated that the correlation and classifying of existent knowledge and the dissemination of special knowledge to the particular persons who can make use of it are as important as the original determination of new truths. The information section of the National Research Council lists 999 industrial research laboratories in the United States in 1927; this is in addition to the laboratories of the universities and colleges of the country. The Navy to keep ahead of the development in other countries should provide some means of dragging out from these laboratories isolated scientific facts and curious phenomena and applying them to its problems.

Research, by its very name and purpose, has always required concentration, but formerly it did not require particular specialization. A scientist jumped from one subject to another as his interests might dictate. With so much that was unknown, he could take the cream and leave the mopping up of the details to later times. To quote from an address by Dr. Little before the Franklin Institute:

> Among all the activities with which his busy life was crowded, Franklin undoubtedly found his greatest interest in the pursuit of science. At a time when nearly everything was awaiting explanation his focussed attention ranged like a searchlight over many fields. He observed the movement of winds and developed a theory of storms. He considered ventilation and the causes of smoky chimneys and proceeded to invent new stoves. He introduced the Gulf Stream to Falmouth shippers, and demonstrated the calming effect of oil on turbulent seas, to officers of the British Navy at Portsmouth. From earthquakes he turned to the heat absorption of colored cloths and the fertilizing properties of gypsum. He wrote on sun spots and meteors, waterspouts, tides, and sound. The kite which for centuries had been the toy of boys, became in Franklin's hands a scientific instrument, the means of a great discovery.

Thus we see that in Franklin's day one person could contain in his own head most of the knowledge that was available on a great many subjects; could do his own correlation of this knowledge, and apply it directly in practice. But today each individual branch of science is larger than the entire body of science of that time. A modern Franklin or Leonardo da Vinci may still contemplate the entire field of knowledge and consider its interrelationships, but no man can do creative work in the entire field. A specially gifted man, such as Dr. W. R. Whitney of the General Electric research laboratories, can leave his imprint in many fields, but the great bulk of the research of the present and the future must be carried out by persons highly specialized in their particular field.

When science was younger and when the chief interest lay in those branches of physics where conditions could be controlled easily, as in the science of mechanics, laboratories could belong to the individual. But as the sciences have developed, more elaborate equipment has become essential, and the providing of laboratories has become a function of the state or the university, or the corporation.

Those concerned with research in the universities and in the industrial laboratories are always glad to assist and advise on naval problems. Experience has shown that the response is 100 per cent in all cases where assistance and coöperation have been invited. There is a romantic spirit in

all men and it is particularly developed in the research worker. Down through the ages the romance of the sea and the Navy has appealed to the adventurous spirit of man, and the Navy can well profit by fostering comradeship with the inquisitive civilian.

The Navy's interest in research and development is of a twofold nature. There are problems to be solved and new devices and methods to be perfected whose major purpose is the improvement of the fleet's effectiveness in war. There are other researches and developments which will incidentally increase the effectiveness of wartime efforts but which also will have far-reaching effects in advancing peace-time civilization.

Though the desire of the naval officer, and the entire Navy, is strong for peace, the major mission of the Navy must be to leave no stone unturned in its plans for effective preparedness. The people of the country decide when a war is to be, and the Navy must be prepared whenever that decision is made.

No matter how diligent we may be in peace time in perfecting methods, means, and apparatus to serve most effectively in war, an actual war will present new situations and new problems. To meet such problems and situations, we require all sorts of specialists, each supreme in his own field, all of them Navy-wise as to conditions to be met, and all trained in coördination, to realize the common goal.

We learned during the World War that the scientist and the research man had to be utilized to the utmost. The type of mine used in the North Sea barrage, the use of gas, the development of listening and other submarine detection devices, new means of communication, and sound ranging, to mention only a few of the important developments, were all brought out under the competitive stress of conflict. All of these developments would have been more effective if they had been available and we had been prepared to use them immediately on our entry into the war.

The directive coördination of naval research must be conducted both in peace and in war by the professional naval officer. This involves no particular difficulty, provided the research workers and the naval officer have learned to speak each other's language and have a general understanding of each other's technique. This mutual understanding and appreciation must be developed by personal contacts and by working together on common problems. It takes time to develop the coöperative and coordinated spirit between these two groups, and it should be accomplished during peace time.

In addition to developing an organization of research workers, trained to think in naval terms, and to work with naval officers, who will be available to solve such problems as may arise during a war, it is desirable that men in the university and industrial laboratories be utilized to help solve naval problems now, in peace time.

In fact, the best way to develop nuclei of naval-minded research men is by assigning to groups, or individuals, certain problems in which the Navy is interested and establishing working arrangements between the civilian and the naval officer.

As previously mentioned, certain desirable naval developments have direct application to the merchant marine and other outside activities. The Navy has, in the past, led in many developments which have had wide usage, and the Navy should continue a progressive policy of developing new methods and apparatus which may have general use, as well as serve special naval purposes. To enumerate but a few: there are new and more economical methods of propulsion to be developed for all classes of craft; there are innumerable problems to be solved in aviation; there are means to be developed for safe navigation in foggy weather, both at sea and in the air; there are many new metal alloys to be discovered, especially non-corrosive alloys to meet naval conditions; and there are many improvements to be made in communications.

Now, if we will accept the desirability of bringing the civilian research man into contact with the Navy, we can investigate the best means of providing a skeleton organization for peace-time use with the idea of expanding it to meet war demands.

We might well start by listing the various special branches of science which might be involved in our problems. This will be a fairly large list for we will find after a little reflection that nearly every scientific specialty bears some relationship to our varied problems. Then it is suggested that

the National Research Council be requested to help select three or four representative men in each specialty who can be appointed with appropriate rank in a naval research reserve. It is proposed to have these reserve officers become acquainted with the Navy by inviting them to make short cruises with various units of the fleet. It might also be found desirable to call some of them, at times, to active duty at the naval research laboratory at Bellevue.

It would probably work out that in certain localities there would be a number of research reserve officers who could be brought together as a local body with contact with some local naval activity and that special naval problems could be assigned to such a local group.

The central office of the research organization in the Department should maintain contacts with the local groups, or individuals, and encourage reports covering scientific developments that might be of interest in any way to the Navy. The classifying, correlating, and applying of the information received would require considerable talent in the central office, but the results would well justify all the efforts expended.

It is believed that the Navy would receive enthusiastic responses from practically all research men who might be invited to join such a naval reserve. Lately the president of one of our greatest universities, famous for its scientific work, stated that he would be glad to give up his presidency if the Navy would turn over a destroyer to him for research work. He did not mean this literally of course, but it is indicative of his readiness to help the Navy and it also shows that he looks back with pleasure on his work with the Navy during the World War. A large number of eminent scientists have been interviewed on this general proposition and they have universally welcomed the idea of coöperation between the civilian investigator and the Navy.

We have been discussing a senior class of research men, but assistants will also be required who might well be inducted into this reserve during their postgraduate period, and as they become more experienced in their later civilian work be advanced to the senior class.

It is believed that the Navy would materially benefit by establishing a certain number of Navy research fellowships at representative technical schools. It would be proposed to have the research students holding these fellowships carry out their researches on problems assigned by the Navy. This is a practice which has been found of benefit to a number of the large corporations. It would be desirable to establish these naval fellowships at universities where senior research reserve officers are attached. The student research man would then be able to carry out his assigned work under the guidance and direction of one or more experienced research men who would also be directly interested in the naval problem. A good example of such an arrangement is now under way at the University of California, where a research on underwater corrosion is being conducted by a student under the direction of Dean Probert and working in coöperation with the Mare Island navy yard. The Navy would thus obtain important data and information, and at the same time would be providing for the training of research men and providing these men with some idea of Navy atmosphere. These research students, after completing their fellowship and obtaining their doctor's degrees, would be commissioned in the research reserve.

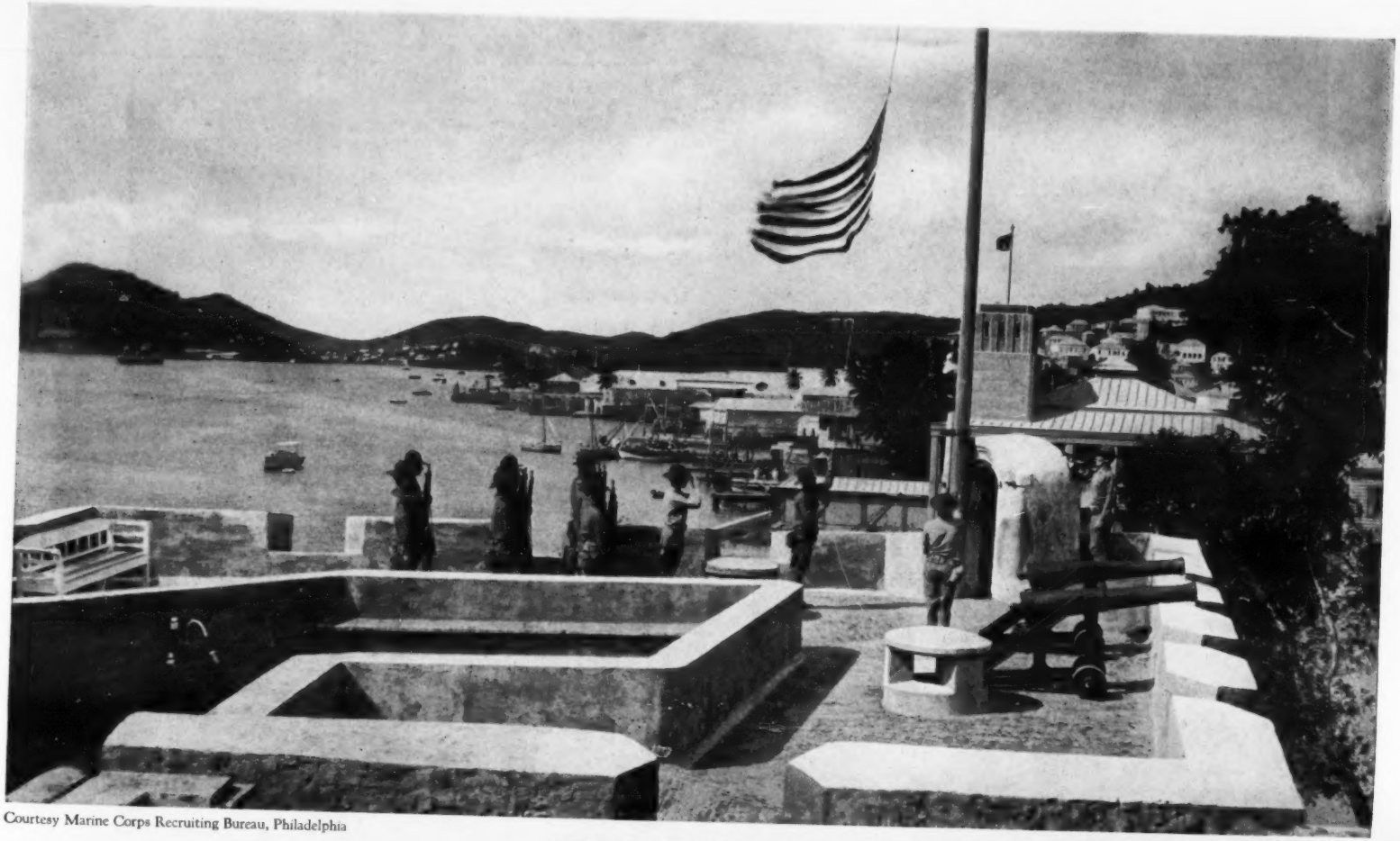
Individual naval officers, or a naval activity, could profitably be assigned to keep in touch with each university or school where one or more fellowships were maintained so as to afford direct personal naval contact with the work undertaken.

It is possible that the Navy might find it desirable to assign, at times, naval officers to university laboratories to work, either independently or in conjunction with members of a research reserve, on special problems. All the large industrial companies have learned by experience that every cent they have spent on research has been returned to them many times over in improvement to their product. It is certain that every cent the Navy may spend in fostering this proposed naval research reserve will be the most profitable expenditure made in its efforts to be ready for emergencies. It is also certain that some such plan, as sketchily outlined, will provide means of materially reducing the maintenance cost of the Navy in peace time, and incidentally, of helping the merchant marine in its efforts to compete with other countries.

MAJOR ZEILIN USMC - THE SECOND AMERICAN TO SET FOOT ON JAPANESE
SOIL - COMMANDED THE MARINES WHO LED THE WAY ON THE OCCASION OF
THE LANDING OF COMMODORE M.C PERRY AT URAGA - JULY
JAPAN TO THE WORLD AFTER TWO HUNDRED YEARS OF SECLUSION.

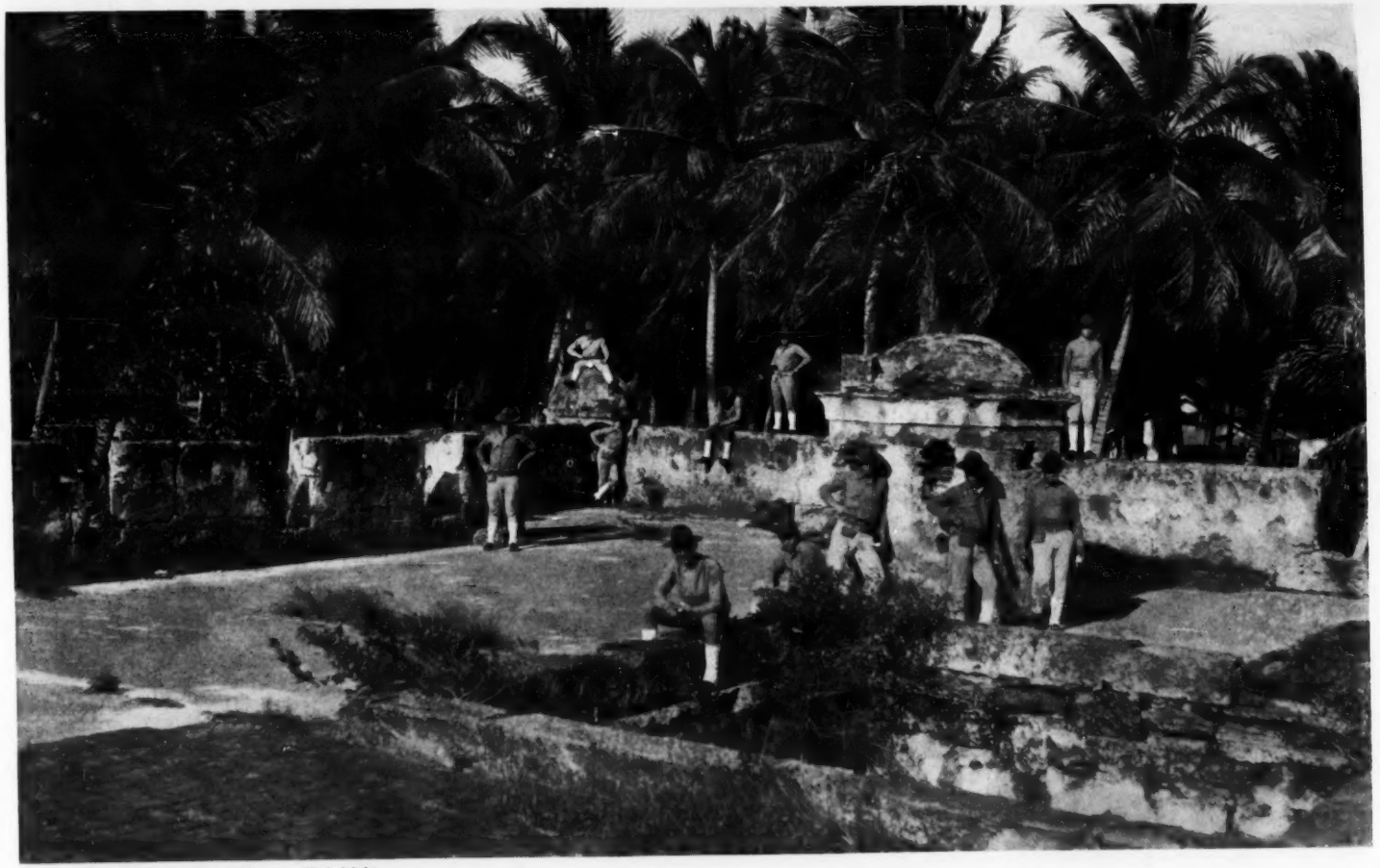
Courtesy Marine Recruiting Bureau Philadelphia. From a painting by J. Joseph Capolino

WITH PERRY IN JAPAN



Courtesy Marine Corps Recruiting Bureau, Philadelphia

"COLORS" IN THE VIRGIN ISLANDS



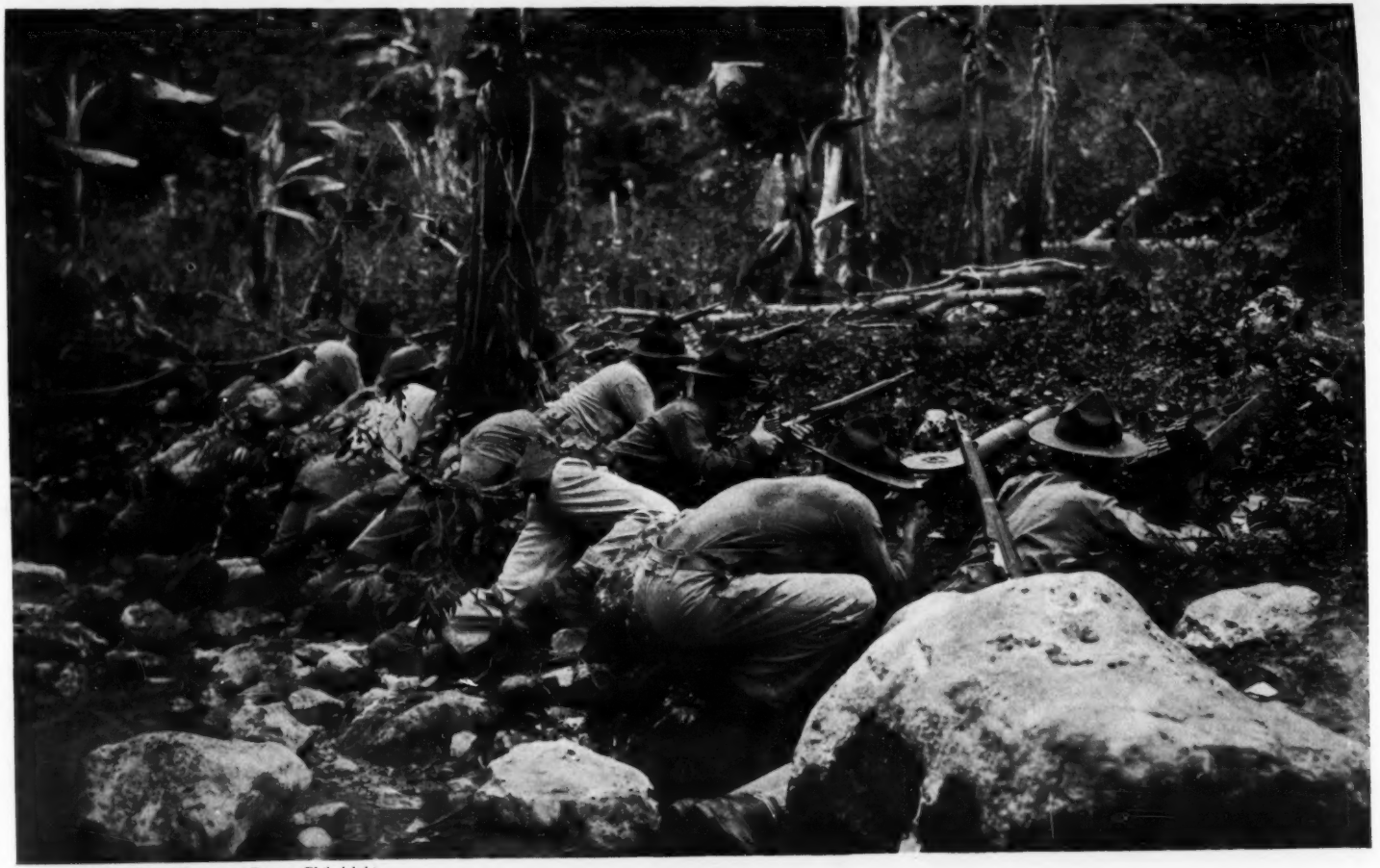
Courtesy Marine Corps Recruiting Bureau, Philadelphia

MARINES SIGHT-SEEING IN HAITI

Courtesy Marine Corps Recruiting Bureau, Philadelphia

IN SANTO DOMINGO
Searching native huts for arms.

Searching native huts for arms.



Courtesy Marine Corps Recruiting Bureau, Philadelphia

IN HAITI
Defending against ambush.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

IN SANTO DOMINGO
The natives claim that Columbus moored his ship to this tree.

The natives claim that Columbus moored his ship to this tree.

U.S. MARINES TOOK PART IN MANY ACTIONS OF THE CIVIL WAR · FOUGHT BOTH
ON LAND AND SEA · THEY WERE AT FORT PICKENS · BULL RUN · NEW ORLEANS ·
PORT HUDSON · FORT SUMTER · ADMIRAL PORTER'S FLEET · AND WERE WITH ADMIRAL
FARRAGUT IN HIS ATTACK ON MOBILE BAY · WHEN THE RAM TENNESSEE

Courtesy Marine Corps Recruiting Bureau, Philadelphia. From a painting by J. Joseph Capolino

AT MOBILE BAY WITH FARRAGUT

Courtesy Ship's Photographer, U.S.S. *Rochester*

AT CORINTO, NICARAGUA
Marines ready to disembark from the U.S.S. *Rochester*.

AT CORINTO, NICARAGUA
Marines ready to disembark from the U.S.S. *Rochester*.

Courtesy Ship's Photographer, U.S.S. *Rochester*

"THE MARINES HAVE LANDED"
Corinto, Nicaragua.

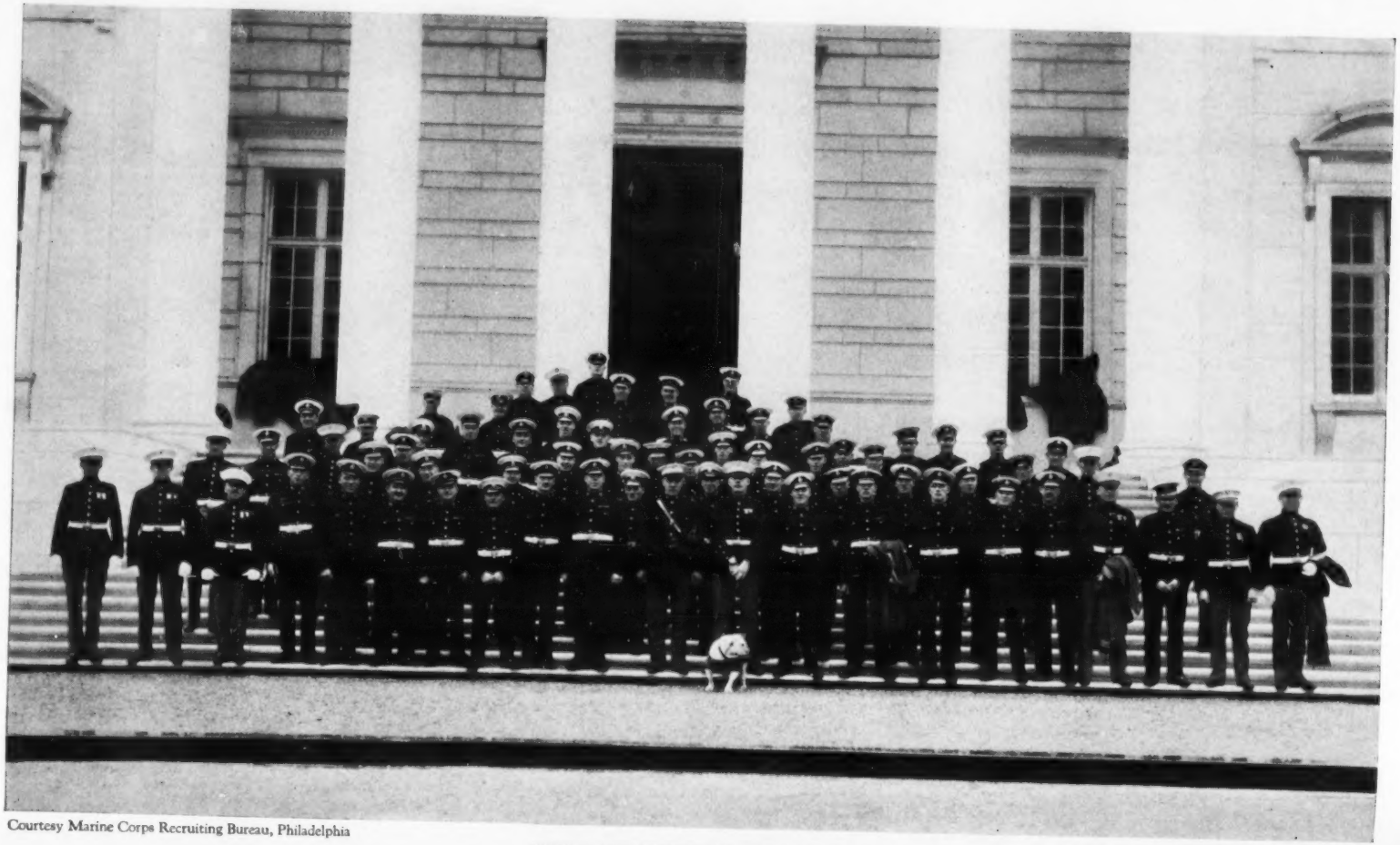
Courtesy Ship's Photographer, U.S.S. *Rochester*

READY TO ENTRAIN
Corinto, Nicaragua.

READY TO ENTRAIN
Corinto, Nicaragua.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

KEEPING THE PEACE IN NICARAGUA



Courtesy Marine Corps Recruiting Bureau, Philadelphia

BRITISH AND UNITED STATES MARINES
At the Tomb of the Unknown Soldier, Washington.

At the Tomb of the Unknown Soldier, Washington.

M. G. M. News

IN CHINA, 1928

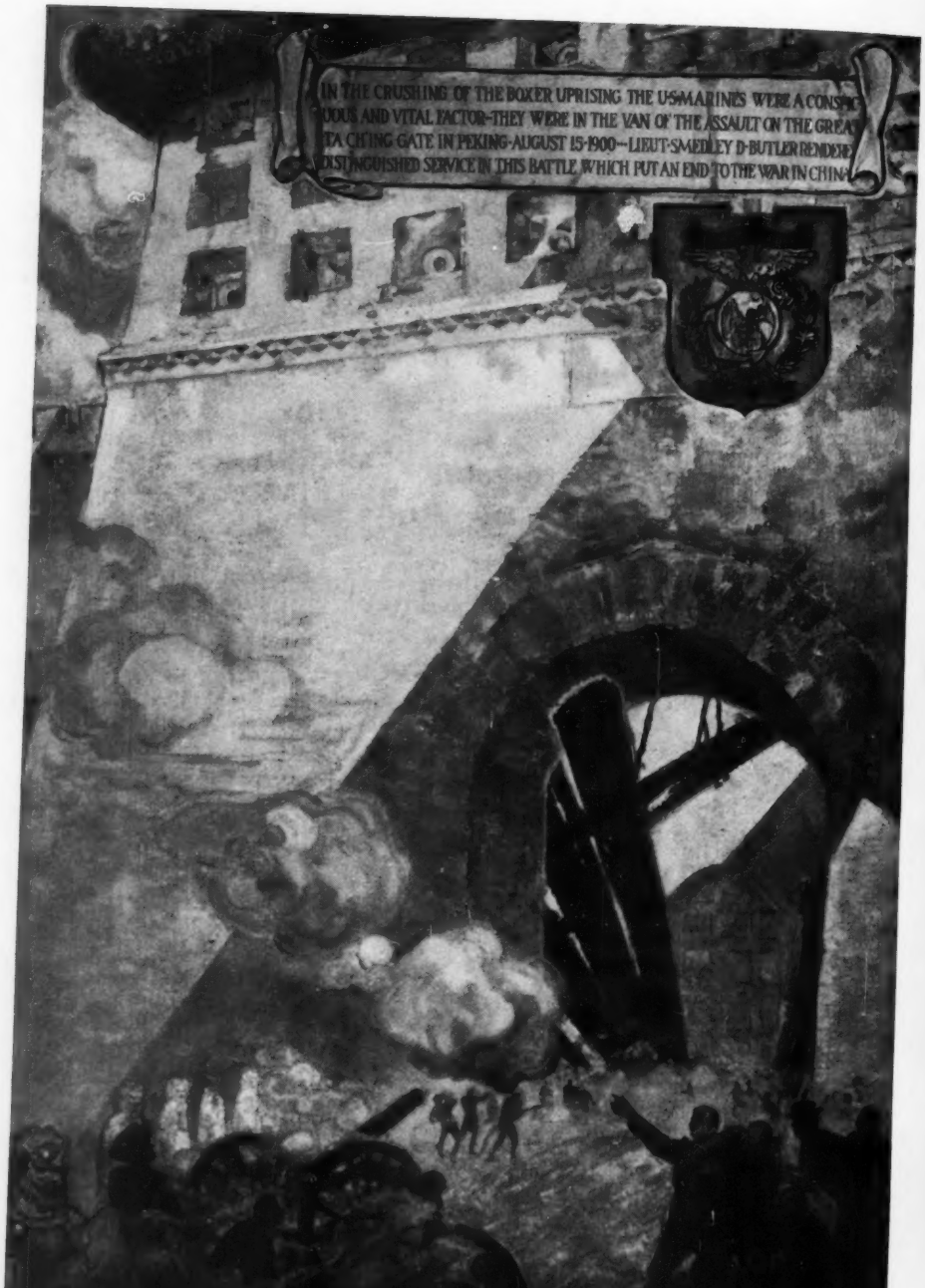
Scene at the race course at Shanghai, as the U. S. marines and bluejackets on duty in China were being reviewed by Admiral Mark L. Bristol, commander in chief of the U. S. forces in the Far East.

The Sport and General Press Agency, Ltd. London

THE ROYAL MARINE MEMORIAL IN THE MALL, LONDON

The Sport and General Press Agency, Ltd. London

A RELIEF BY ADRIAN JONES ON THE ROYAL MARINE MEMORIAL IN THE MALL, LONDON
Showing the united charges of the American and British marines on the wall of China during the Boxer Rebellion, 1900.


IN THE CRUSHING OF THE BOXER UPRISING THE U·S·MARINES WERE A CONSPIC
UOUS AND VITAL FACTOR·THEY WERE IN THE VAN OF THE ASSAULT ON THE GREA
TA CH'ING GATE IN PEKING·AUGUST 15·1900·· LIEUT·S·MEDLEY D·BUTLER RENDERE
DISTINGUISHED SERVICE IN THIS BATTLE WHICH PUT AN END TO THE WAR IN CHINA

Courtesy Marine Corps Recruiting Bureau, Philadelphia. From a painting by J. Joseph Capolino

IN CHINA

"We Will Do Our Best"

By CAPTAIN OLIVER P. SMITH, *U. S. Marine Corps*

"WE WILL do our best." This laconic message, scrawled on a scrap of paper, now gives no hint of the terrible strain under which Captain Myers was working and fighting when he wrote it, nor the desperation which prompted the order to which he was referring; nor taken alone does it convey to our minds any picture of the part played by the American marines in the grim siege of the foreign legations in Peking during the Boxer Uprising in the summer of 1900. But to those who were there it will recall one of the most stirring episodes of that long siege.

This uprising against the "foreign devil" has been termed the Boxer Rebellion, but in the eyes of the Imperial Chinese the Boxers were serving a useful purpose in driving out the hated foreigner and all his works. At the psychological moment it was the intention of the Imperial forces to join with the Boxers and drive these foreigners into the sea.

The I Ho Ch'uan, literally translated, "Fists of Righteous Harmony," became, for short, Boxers, to Europeans. Chinese have a penchant for secret societies and mystic rites. The Boxer society was not new; in 1900 it simply received impetus from contributing circumstances. There had been a terrible drought; starvation threatened thousands. Hence, "The Catholic and Protestant religions being insolent to the gods and extinguishing sanctity, rendering no obedience to Buddhism and enraging both heaven and earth, the rain clouds now no longer visit us." Drive the foreigner out and the gentle rains would follow, bringing peace and plenty. Driving him out might involve physical danger. A dead Chinese could not observe the rites of ancestor worship so dear to him. So the Boxers promised adherents to the faith marvelous powers. They could lift millstones with a thread, they could be exposed to all kinds of attacks with knives, swords, and spears without personal injury, gun-fire would not harm them. To prove this, an apostle of the faith would load a ponderous weapon with powder, pour in some shot (neglecting to wad the shot), make incantations with the gun (in the course of which the shot would roll out), aim the weapon at the neophyte, fire, and after the smoke cleared away, there he stood uninjured. Of course, the ignorant peasantry flocked to their standards by the hundreds. It is true that one neophyte was practically shot in two in one of these demonstrations (the shot no doubt did not roll out), but that was explained on the ground that he had not sufficiently imbibed the spirit of the faith.

The Boxers had grown strong in Shantung, but the presence of Yuan Shi Kai, later President of China, and an able administrator, caused them to move to the province of Chihli, in which Peking is situated. Here they continued to gain adherents, loot missions, and kill Chinese Christians. Any Chinese associating with Christians was a "secondary devil" and marked off for extermination.

The ministers at Peking were not insensible to the growing menace to foreigners. An Imperial edict of January 11, 1900, practically endorsed the Boxers. Why not? Did not their standards bear the motto, "Protect the Empire, Exterminate Foreigners"? The Manchu dynasty was tottering; the Empress could not afford to offend the Boxers. However, Mr. Conger, the American minister, protested the edict. Then on January 25 the ministers requested the suppression of the Boxers. This request was unanswered until February 25. Finally, another edict was issued nullifying the first, but following it went secret instructions to disregard the second edict. The eternal Chinese game of "saving face."

Looking backward it is hard for us to see why energetic steps were not taken to enforce protection of foreign lives and prop-

erty. Apparently, as late as April and May, 1900, the ministers still felt that the Chinese government would afford protection. But on May 19, Mgr. Favier, vicar apostolic of the Roman Catholic missions, in a letter to the French minister, requested protection for the persons and property of his flock. He stated that the persecution of the native Christians was merely a blind, that a day had already been fixed for the attack on the churches and legations and the annihilation of all foreigners. Mgr. Favier had ample means to learn the truth. His message was ominous, but it was still thought by many that a good rain would prove a panacea.

Up to this time the Boxers had practically confined their activities to the persecution of native Christians and the looting and destruction of their property. But on May 28 they went further. The Feng T'ai station, only six miles from Peking, was attacked, the railroad destroyed near there, and the European railroad employees, unable to escape, were in a precarious position. They were rescued by a party sent out from Peking. There was no doubt as to the identity of the attackers. The banners of the Boxers had been prominently displayed. The ministers were forced to act quickly. Guards were called for, but, to preserve diplomatic usage, permission was requested of the Tsung li Yamen. The Yamen objected, but the ministers were insistent; there was no feeling of security in Peking now.

Already on the afternoon of May 26, 1900, the U.S.S. *Newark*, then lying at Nagasaki in company with the U.S.S. *Oregon*, had received sailing orders for Taku Bar. So urgent was the call that Captain McCalla, the commanding officer, who was ashore at the time, made his ship only by commandeering one of the steamers of the *Oregon*, and boarding the *Newark* while underway. Captain John T. Myers (now colonel) on an hour's notice had earlier been embarked on the *Newark* from the *Oregon* with his marine detachment of twenty-five men. Captain Newt H. Hall (now colonel) commanded the marine detachment of the *Newark*.

These marines were not new to field duty. They had just come from the Philippines and the "pest hole of Cavite." Captain Myers' detachment was the first American force to occupy Olongapo, later so familiar to marines. The *Newark* detachment, as a part of the ship's battalion, had campaigned in northern Luzon. Many of the men in both detachments had also served in Cuban waters during the Spanish War. They were inured to tropical heat and rain, knew how to use a rifle, albeit the Lee Straight-Pull, twenty-two caliber, with which they were armed, had little stopping power and was a continual source of annoyance.

But to go back to the *Newark*. On the afternoon of May 27 she arrived off Taku Bar at the mouth of the Pei-ho River, that desolate stretch of muddy yellow water with no land in sight, where ships of war which have business with Tientsin are forced to anchor because of the bar thrown up by the river. Here were lying a French cruiser and gunboat and three Chinese cruisers. On the twenty-eighth, the very day Feng T'ai was in flames, the French vessels put to sea. Sudden sailing orders always give rise to rumors, but the actions of the French vessels certainly belied any immediate danger to foreigners ashore.

On the twenty-ninth, before dawn, the marines had made the long boat trip over the bar, past the low mud forts at the mouth of the Pei-ho, past innumerable junks and sampans, to the dingy village of Taku. They were joined later in the day by the ship's battalion. Being armed, the railroad would not transport them to Tientsin, so all hands were packed into a covered lighter and towed to Tientsin, to the joy of the resident foreigners.

Captain McCalla and the American consul wanted to send the marines to Peking at once, but again the officials of the railroad refused to transport armed troops. Now the appeals of the ministers in Peking began to take effect. Guards of all nationalities were pouring into Tientsin, pressure was brought to bear, and on May 31 the officials yielded. A special train was made up, and the international guard, packed in and bound for Peking, left at 4:30 P.M. the same day.

Into this train went the American contingent, under command of Captain Myers, consisting of twenty-five marines from the *Oregon*, and Captain Hall, Assistant Surgeon Lippitt, twenty-three marines, three bluejackets, and one hospital apprentice from the *Newark*. The *Newark* men

brought with them a Colt's gun on a wheeled mount, later to account for many Boxers and Imperial troops and to prove the most reliable automatic weapon of the besieged legations. These marines could shoot and meant to shoot, and, though they took no baggage except that on their backs, they did not neglect their ammunition supply. There were 9,720 rounds in the men's belts, 8,000 for the Colt's gun and 10,000 in boxes, making a total of 27,720 rounds. There were no clothing issues during the siege, but there was always ammunition to be had, and when the siege was over there still remained 7,000 rounds. Some of the other guards had only the ammunition carried in the men's belts, and the shortage later became serious. This being an international guard, there were many types of rifles, which made the interchange of ammunition impossible. The baggage was to be sent up later by train, but never arrived, because of the destruction of the railroad on June 6. To provide for all contingencies five days' rations and two large ship's breakers of water went with the ammunition. The marines left Tientsin in undress blue with heavy marching order, a uniform now only seen, with modifications, in the fleet.

Upon arrival at the railway terminal four miles from the Ch'ien Men Gate, Captain Myers led off with his detachment. Following him came the white-helmeted British marines, later to join hands with their American cousins in the defense of the Tartar Wall. Then came plodding Russian sailors, stolid defensive fighters; the wiry little Japanese, cut all on one pattern, who were to suffer one hundred and four per cent casualties without flinching; a French *compagnie de debarquement,* in their ill-fitting blue cotton uniforms, slovenly in appearance, but to prove far from slovenly in the defense of their legation; and finally a guard of swarthy Italian sailors. The German and Austrian guards followed on June 3. Twenty-one officers and 429 men were there, with a big task ahead of them.

Raising a suffocating cloud of Peking dust, and oppressed by the all-pervading stench of the native city, Captain Myers led the column toward the Ch'ien Men, one of the southern entrances through the high Tartar Wall. Masses of Chinese lined the road. There was no demonstration, only ominous silence. Cowed, no doubt, but they would be vociferous in a few days. Attended only by this silence the guards passed on through the Ch'ien Men and to their respective legations, a gladdening sight to the anxious ministers. To men who had just marched several miles through a hostile crowd, any moment expecting some outbreak, the startling welcome the marines received upon their arrival at the American compound was for a moment disconcerting. Just as the guard swung into line for the halt, there was a blinding flash. One of the guests at the legation was taking a flashlight picture.

On June 2 Captain McCalla, Paymaster Jewett, and Naval Cadet Courtney, who had accompanied the column to Peking, returned to Tientsin on the last train which went through uninterrupted. Captain McCalla was later to join Admiral Seymour's column with his ship's battalion in an attempt to relieve the legations. But this column, after getting within a few miles of Peking, found the lukewarm neutrality of the Imperial forces in its rear changed to hostility by the Allied attack upon the Taku forts, and, after desperate fighting, was finally rescued by the Allies who had brought about its difficulties. The progress of the Seymour column was to give rise to endless speculation in the besieged legations and finally to grim despair.

While the guards had arrived in Peking, the ministers still hoped for the protection of the Imperial troops. In spite of the warning of the French bishop, they did not dream that the Empress would dare to open the gates of the city to the Boxers. Each guard had been requested to protect its own legation. Captain Myers had been reminded by Captain McCalla that the protection of the American legation was entrusted to him and that in things military he was in command. Each detachment commander, no doubt, had similar instructions or ideas. But all the legations were facing the same peril; the weakest link in the chain would determine the fate of all. The Austrian legation was on a side street and the Italian legation was isolated. The Su Wang Fu palace and grounds, if occupied by an enemy, would threaten any scheme of defense. On June 6 the railroad communication to Tientsin was cut. The situation was critical, still there was no concerted plan of action. On June 7 Captain Myers requested the senior British marine officer to call a meeting of all

the officers of the guards. The outcome of this meeting was a decision to hold the individual legations as long as possible, to hold the Tartar Wall in rear of the German and American legations, to send all non-combatants into the British legation, better suited than any other for their care and protection, to gather together all possible supplies of foodstuffs and live stock, and to barricade the streets and keep communication open between the legations. These barricades were at first not military barricades, but merely for the purpose of stopping traffic through the legations. At this date the ministers were still requesting permission from the Yamen to take this latter precaution. Although the legations had adopted a plan of defense, there was no commander, and a commander is essential for the successful execution of joint military action. Perhaps the ministers did not see this at the time, because the legations had not yet been subjected to a concerted attack. But it was tacitly agreed among the military and naval men that they would recognize the authority of Captain Thomann of the Austrian Navy, on leave in Peking from his ship when the railroad was cut.

The marine guard had been quartered in rear of the legation, access to the legation being had by a passageway cut through the legation wall. The quarters were comfortable enough, but when the Chinese later began to apply the torch to everything inflammable in the vicinity of the legations, the quarters went the way of the Methodist mission, the Hanlin College, and thousands of other buildings and homes. Until the siege began in earnest the rationing of the guard was simplicity in itself. A contract was made with a Chinese to furnish three meals a day at seventy-five cents (Mex.) per man, somewhat less than the value of the present ration. As to balance of the ration there is some question, particularly later on when there were no fresh fruits or vegetables to set off rice and horse, pony, or mule meat. The horse meat became tolerable when served with curry, and it was the standing jest of the legations to ask if the horse had been curried.

A marine would not be at home unless he were guarding a main gate somewhere; the first thing done was to establish a guard over the main gate of the legation and at various points around the legation compound. Ten men under a corporal were sent to guard the Methodist mission, a half mile away, increased to twenty under command of Captain Hall later. This mission was not included in the scheme of defense of the legations, but there were 70 Americans and 600 converts there, who were loath to crowd into the British legation as long as they could remain safely in their own mission. The defense of this mission was against the better judgment of the officers, an estimate of the situation which was confirmed on June 19 when the rumblings of rebellion became so intense that fifteen more marines had to be sent out to escort the mission population to the British legation.

The comparative quiet following the arrival of the guards did not long continue. On June 6 the missionaries reported that the Boxers were coming into the city in great numbers. On June 9 the race-course club building was burned. On June 10 the beleaguered legations confidently expected the arrival of Admiral Seymour's relief column, and many went to the railway terminal to welcome them. No column arrived but they saw large bodies of Kansu soldiery camped in the open spaces outside the Tartar Wall. Amid the jeers and hoots of these supposed protectors they hastened home. On June 11 the Japanese chancellor was killed while en route to the same station. On June 12 Baron von Kettler, the courageous German minister, while walking along Legation Street, was astounded to see a Boxer sitting in a hooded Peking cart, in full regalia, red head-dress, red sash, red ribbons on his wrists and ankles, calmly sharpening a large knife on the soles of his boots. The Baron wasted no time. Rushing this Boxer brave, he administered a good beating with his walking stick. The Boxer, not being immune to a caning, took to his heels. Out of the cart came another, upon whom the German minister promptly pounced. The Yamen had the affrontery to request the release of the captured Boxer. These were only the forerunners of hordes of fanatics, bent on the extermination of foreigners, temporarily kept without the gates by untrustworthy Chinese soldiers.

The von Kettler affair had attracted a crowd. The excitement spread, and by the night of June 13 the noise in the Southern City over the Tartar Wall was full of fore-

boding. Now loud, now dwindling in volume, but always, "Kill the foreign devils! Kill! Kill!" Then the flood-gates were released by the half-sympathetic Chinese soldiers on the wall. The Boxers swarmed through the Hata Men. Deflected from the legation area by fire from the Austrian legation, they contented themselves with looting and burning out of reach of rifle fire. A stream of Chinese Christians, most of them horribly burned and wounded, appeared at the barricades, concrete evidence of the ferocity of the Boxers. Flesh and blood could not stand such sights without being moved to pity, and the marines in the next few days participated in several rescue excursions. In one of these, in which Dr. Lippett participated, a Boxer meeting in a temple was discovered, and short work was made of the forty-five Boxers. After witnessing the atrocities committed, no mercy was felt or exercised.

On June 16 the Boxers set fire to Watson's drug store in the Southern City, not far from the Ch'ien Men. The explosion of chemicals there caused the fire to spread rapidly, and the richest portion of the city was gutted. The Boxers had intended to burn only the patent medicine stores. To appease the shopkeepers who had lost heavily by the spread of the fire, they made this explanation. When the fire was started they had told the crowd that by encircling the burning buildings, with their hands joined, and muttering certain charms, they could prevent the spread of the fire. However, glibly explained the Boxers, one of the crowd had thrown a bucket of dirty water on the fire, and the leader, noticing this act of insolence, had opened his fingers, thereby loosing the flames.

On June 17 the last tenuous wire connecting the legations with the outside world via Calgan was cut. On this same day two members of the Tsung li Yamen requested Mr. Conger to withdraw the marines, stating that the Chinese would protect the legations. They were politely informed that the legations would protect themselves.

June 19 marked the beginning of the second phase of the siege. Previous to this time the Boxers had been the main actors. Now the Tsung li Yamen informed the ministers that, the Taku forts having been attacked, a state of war existed, and the ministers were requested to leave within twenty-four hours, protection being guaranteed as far as Tientsin. This was a bombshell. The ministers had had no information of the attack on the Taku forts; they only knew, or thought, that Admiral Seymour's column was attempting to relieve them. A hurried counsel was held, and the ministers agreed to withdraw providing members of the Yamen accompanied them as far as Tientsin. There was feverish packing and requisitioning of carts. But the Prussian in Baron von Kettler began to assert itself. He informed the other ministers that he had an appointment with the Yamen at eleven o'clock the following morning, that he would keep the appointment, and that he would inform the Yamen that if the ministers were driven out it would be the end of the Manchu dynasty. The next day he started out to keep his appointment, accompanied only by his interpreter. Later the interpreter dragged himself into the Methodist mission more dead than alive. Baron von Kettler had been shot in the back by a Chinese soldier on the great street leading north from the Hata Men. His body was not recovered, although the enraged German guard set out to recover it and avenge his death. This blow settled the question of evacuation. The prospect of 1,000 Europeans trekking ninety miles to Tientsin, open to attack from Boxers and Imperial troops alike, now appeared preposterous. A siege was safer, and would ease the consciences of the missionaries with regard to the hundreds of converts who had flocked to them for protection. The Baron's death with the resultant decision saved a massacre.

Parenthetically, it is pitiful to note that years later, short-sighted Occidentals, blinded by hate, allowed the Chinese to tear down the monument to Baron von Kettler erected on the spot where he was killed. They failed to see that the Chinese were being allowed to tear down Occidental prestige, and that the way was being prepared for the very recent troubles in China.

The time limit for the withdrawal of the ministers expired at 4:00 P.M., on June 20. At that hour, fire was opened by the Imperial troops on the Austrian legation. The Boxers were now given a minor rôle, and the Imperial troops began to occupy the stage. The awe in which the Boxers had been held by the Chinese troops was gradually being replaced by contempt. They had proved themselves not invulnerable and their looting had perhaps been a little too unre-

strained. The Boxers had no leaders. The Chinese troops were generaled by intelligent men, but had no leaders among the company officers. The legations had good company officers but no generals. The result was that a few hundred resolute men in the legation guards withstood for two months the intermittent and disjointed attacks of several thousand Chinese.

South of the American legation, across a narrow street, arose the high Tartar Wall, fifty feet wide at the base, forty-five at the top, and forty feet in the air. The outer faces and top were coated with bricks, one and a half feet long by nine inches wide and six inches thick, thousands of which were laboriously dug out at night, sometimes under fire, by cowering coolies, to provide the main material for barricades. On top of the wall, facing north or toward the legations, was a low parapet. The south edge of the wall, facing the Chinese city, was bastioned at 100-yard intervals. To the westward, along the wall, was the Ch'ien Men; to the eastward, the Hata Men. Parallel to the Tartar Wall and about a third of the way to the wall of the Forbidden City ran Legation Street, on which were situated most of the legations. A canal, almost dry until the rainy season made it a torrent, came from the Forbidden City through the center of the legations and passed out under the Tartar Wall by a water gate to the moat on the other side. It was essential to hold this water gate to provide a means of egress for the legations and, when relieved, a ready means of ingress for the relieving column. Through this very gate the first contingents of the relief column later entered the legation area. Due to their isolation, the Dutch, Italian, and later the Austrian, legations were abandoned. Of the legations in the defended area, only the American and German lay between Legation Street and the Tartar Wall. To the defenders of these legations fell the task of holding the wall in their rear. Access was had to the wall by double ramps in rear of each legation.

The area to be defended by the legation guards was roughly about 1,000 yards square and had a perimeter of 4,000 yards. To hold this area there was one man to about eight yards of front, a number small indeed, considering the size of the besieging force. Until June 20 twenty marines were on detached duty at the Methodist mission, leaving only twenty-three men to guard the legation. On June 20 when Captain Hall returned from the Methodist mission, bringing the guard up to its full strength of fifty-three, the force was still pitifully inadequate to guard the legation compound, the approach to the Tartar Wall, and the wall itself behind the legation. It must be borne in mind that, until the Yamen delivered the ultimatum to the ministers, diplomatic usage had been preserved. No attempt had been made to erect military defenses. Such barricades as were erected were only for the purpose of preventing traffic through the legation quarter. After the murder of Baron von Kettler, however, the building of military defenses proceeded apace.

To the surprise of most of the guards, on the morning of June 22 an order was received from Captain Thomann to retire on the English legations. Upon arrival at the English legation it was found that he had ordered the withdrawal on the basis of the false report that the Germans and Americans were abandoning their legations. The guards were hastily despatched to their respective legations and reoccupied them without loss. A demand now arose for the recognition of Sir Claude MacDonald, the British minister, as commander-in-chief. Having been a major in a Highland regiment, Sir Claude was considered to have the necessary military qualifications. Thenceforth he directed operations.

The Germans now took up a position on the Tartar Wall in rear of their legation to stop traffic between the Hata Men and Ch'ien Men. This did not prevent the Chinese from coming down the wall as far as the American legation, and on June 24 they opened a harassing fire on the buildings and grounds. The Germans promptly drove them back up the wall toward the Ch'ien Men, and then retired to the ramps behind their own legation. About 1:00 P.M., Captain Myers with all marines who could be spared from the other defenses, ascended the wall in rear of the German legation. Leaving a few men at the ramp to protect his rear, and in the face of heavy fire from the direction of the Ch'ien Men, he worked his way up the wall beyond the American legation as far as a pile of débris. Masses of smoke from the burning Russian bank and houses nearby poured over the wall. This, and the stream of bullets coming down the wall,

held up any further advance. Incidentally, the fire wiped out the marine quarters. The men had flattened themselves out behind the débris, in the bastions and at the head of the ramp in rear of the legation, and returned the fire as best they could. The party left at the German ramp to guard the rear were also fully occupied. Allowing for a certain amount of exaggeration, Private John O. Ammon graphically tells the story:

> We were attacked from the Hata Men by the enemy and Captain Hall went to Captain Myers and got two men. We then repulsed the enemy, which was about seventy or one hundred strong, coming out of the Hata Men Gate. We then discovered from the ramp about two hundred Chinese coming down the street from the Hata Men side. We were about to fire upon them when our attention was called to a great number, about four hundred, coming out of the Hata Men Gate with flags and banners, whereupon Captain Hall blew his whistle and made signs to the German sentry who was posted at the rear gate of the legation. Thereupon the German commander came up with about ten men. . . . . The Chinese were driven into the gatehouse. We then formed along the wall and soon dispersed those in the street.

Heavily outnumbered in front and rear, under fire from the Hata Men and Ch'ien Men Gates as well as from trees and houses near the wall, Captain Myers decided to withdraw. One at a time the men retreated from bastion to bastion, then singly down the ramp and across the narrow street at the foot of the wall to the protection of the legation walls.

Late the same afternoon Captain Myers made another attempt to take and hold the wall. This time Captain Hall was sent with a part of the men to ascend the wall in rear of the German legation. Captain Myers ascended the wall in rear of the American legation and delivered his fire down the wall in the direction of the Ch'ien Men as Captain Hall came along the top of the wall from the direction of the German legation. The Colt's gun was put into action, but again the fire was so heavy that a lodgement could not be effected, and the wall was abandoned.

At 3:45 P.M. on June 25, Captain Myers again led his men up the wall and this time effected a lodgement, as did the Germans in rear of their legation. Ordinarily, coolies were drafted to build barricades, but they could not be cajoled into going on the wall for that purpose. The marines did not wait for such help and soon had a temporary barricade erected at the head of the eastern ramp behind the American legation. The location of this barricade was determined by accidental cover found at the time, which proved later to be a grave error, as the Chinese were enabled to come up the western ramp, and, protected from fire from the marine barricade, were able to project a barricade across the wall within thirty feet of that of the marines. At 6:00 P.M. fifty coolies were sent on the wall to strengthen the barricade already built; to induce them to stay and to work hard all night each man was given three pounds of rice extra. By 11:00 P.M. they had finished their work.

All day the Chinese had delivered a heavy fire down the narrow street running along the base of the wall. Captain Myers had directed men crossing this street to make a running dive for the foot of the ramp. Even this method of getting across was not always successful, as evidenced by Private Richard Quinn:

> Captain Myers was on the wall and he sent down for reënforcements. Mitchell with the Colt gun went ahead of us. I think they succeeded in getting across the wall street without a shot being fired at them. Mueller and I were next. I said, "Let's run for it." We had gotten half way across the street when they opened up on us. I was struck on the knee, flesh wound, I fell. I looked back and saw Mueller lying down and I ran back and helped to pull him back in a sort of shanty at the foot of the ramp. I then went up to the top of the wall carrying Mueller's rifle with me. This rifle was cut in half.

In order to make the approach to the wall safer, Captain Hall broke through the wall of a building opposite the eastern ramp and with the material thus obtained, built a barricade across the street. This was later converted into a communication trench with protection from fire from both directions.

On June 26 the Chinese busied themselves in strengthening the barricades in front of the marines. All day the Chinese trumpets had been blowing, presaging an attack for the night—those two-man brass trumpets which drop so quickly from the high to the low notes, producing an unearthly noise.

While the able-bodied men were grimly occupied at the barricades, the women nobly performed the tasks assigned them. There were no hysterics. The few sewing machines in the area were put to use, and before long were turning out 2,000 sandbags a day. Thousands of dollars worth of appropriated satin, silk, and damask went into these bags,

along with regular sack cloth. The particular favorite of the marines was Mrs. Conger, the wife of the American minister. Her motherly interest in their welfare made a lasting impression on them. They all looked forward to the dinner which she promised them when the siege was lifted.

Had the legations been overrun by the Chinese the fate in store for the women and children was not pleasant to contemplate. Perhaps the following was said in jest, but it may indicate the trend of thought among the women. Dr. Martin overheard one of the young ladies, a guest at the American legation when the siege set in, say to Captain Myers, "Now remember, should they overpower us, your first duty is to shoot me." Fortunately Captain Myers was not confronted with such a dilemma.

The Boxers, who were rapidly losing "face" with the Chinese soldiers, were last seen in any numbers on June 27. In the morning a sentry on the wall noticed that the Chinese were breaching their barricade, which was then about 400 yards distant. Quickly the loopholes and the firing step were manned, but fire was withheld. The Chinese silently issued from the breach in their barricade, and, hugging the sides of the wall, ran toward the American barricade, waving their pikes. Closer inspection revealed them to be a force of about 200 Boxers driven on by Imperial troops in their rear. They had hoped in the heat of the day to catch the marines unawares. When within about 200 yards the marines gave them volley after volley, part of the men firing through the loopholes and part over the barricade from the firing step. Some of the Boxers leaped over the wall; others wriggled back to the protection of the barricade through the tall grass growing on the top of the wall. The enemy losses were heavy and estimates ranged as high as 50 dead.

Apparently this day was the first on which the Imperial troops on the wall had taken the offensive, for Captain Myers wrote Mr. Conger from the wall:

> They have just raised the Chinese flag, so if we fire now we fire on the Government. The Hata Men is firing over me now and the sharpshooters in the trees and on the roofs on my right front make it unsafe for anyone to show his head. . . . . I have now nineteen marines, three sailors, U. S., five Germans, two Russians. We have of course been up all night and are not in very good condition for a fight. The men are further disheartened by the loss of their first sergeant (Sergeant Fanning) last night. I will do my best. . . . .

However, the Boxers and Imperial troops found plenty of fight in the marines when they tried to rush the barricade. Later on during the truce one of the Chinese officers said that the men with the felt hats (American marines) had killed 300 of his men.

The bodies of the Chinese lying in the sun on the wall in front of the American barricade soon made life almost unbearable. With the continual sniping at close range, neither the Chinese nor the Americans ventured out to dispose of the bodies. Fortunately the supply of smoking tobacco was fairly plentiful at this time, giving some relief. Finally, on July 18, during the truce the Chinese requested permission to bury their dead. No hesitation was shown in granting the request.

Reference is continually made to the sniping of the Chinese. We are prone to believe that Chinese are experts at missing each other, but Private John O. Ammon gives us as his impression:

> Their fire was poor as to the amount of men they had, still they had some good sharpshooters, who did the sniping. Most of the fire was sniping except when there was a general attack. These attacks came quite often at no special hour. . . . . They seem to be very good in picking up the range with their big guns. Within five shots they succeeded in knocking down our flagpole at the legation gatehouse.

It must be remembered also that the relief column of the Allies suffered 775 casualties in one day before Tientsin.

June 28, the first day of the Chinese sixth month, is a particularly lucky day in Chinese eyes. It was an unlucky one for the Americans. During the dark nights the Chinese had stealthily advanced their barricade bit by bit. They now opened upon the American barricade with two 3-inch field pieces, one on either side of the Ch'ien Men gate house, and with a 1-pounder from the gate house itself. Captain Hall had relieved Captain Myers early in the morning. At about 9:30 A.M. Captain Myers sent up an Italian 1-pounder with two Italian gunners, in an attempt to silence the artillery. It was necessary to send a 1-pounder to do the work of a field piece, as the legations had no artillery. The Colt's gun was, of course, useless for this purpose. In order not to breach the barricade, the 1-pounder was

propped up so that it could be fired over the top. The Chinese soon picked up the range of the barricade and began knocking it down. Both Italian gunners were wounded. Gunner's Mate Mitchell stepped into the breach and manned the gun, firing between shots from the Chinese. The marines had worked out a system of protection against artillery fire. A man was posted at a loophole to watch for the flash of the enemy piece. When he saw the flash he would shout, and all hands would drop into the small trench behind the barricade. With projectiles striking the barricade every three minutes or so, Mitchell could not make much headway with the 1-pounder and in order to protect from damage their only piece of near-artillery, Captain Hall ordered the gun taken down. The Chinese now opened up with rifle fire from a joss temple on the right. The Austrians and French, at the time occupying the German barricade 500 yards in the rear of the American position, were seen to be leaving the wall. A party of about 200 Chinese were advancing down the wall street from the direction of the Ch'ien Men. There was danger of being cut off and one at a time the men were withdrawn from the wall, but not for long.

No matter what the cost, the wall had to be held, to prevent fire from being delivered into the legation compound at short range and to protect the water gate under the wall. Captain Myers, after consulting with Mr. Conger, sent word to the Germans to ascertain what steps they were taking to regain their former position, as joint action was necessary. The German commander sent back word that they were taking the wall at the point of the bayonet. In the meantime Captain Myers had gathered together all available men and started back up the ramp. When the withdrawal had been effected the Chinese must have suspected a trick for they made no effort to occupy the abandoned barricade. Also, for reasons which would probably be inexplicable to Occidentals, the Chinese ceased firing with their artillery. Consequently, Captain Myers was able to reoccupy his position without loss. The Germans also reported that they had retaken their position "at the point of the bayonet."

The missionaries had confidently predicted that Chinese superstition would prevent them from attacking during a storm. On June 29 there was a furious storm of wind, rain, and thunder, but there was no diminution in the fire of the ememy. For another time missionaries who had lived in China for years erred in predicting what a Chinese would do under given circumstances.

This same day Assistant Surgeon Lippitt, who had done splendid work with the marines on the wall, was severely wounded in the hip while crossing the court yard near the American legation, and joined the ever-increasing number in the extemporized hospital at the British legation.

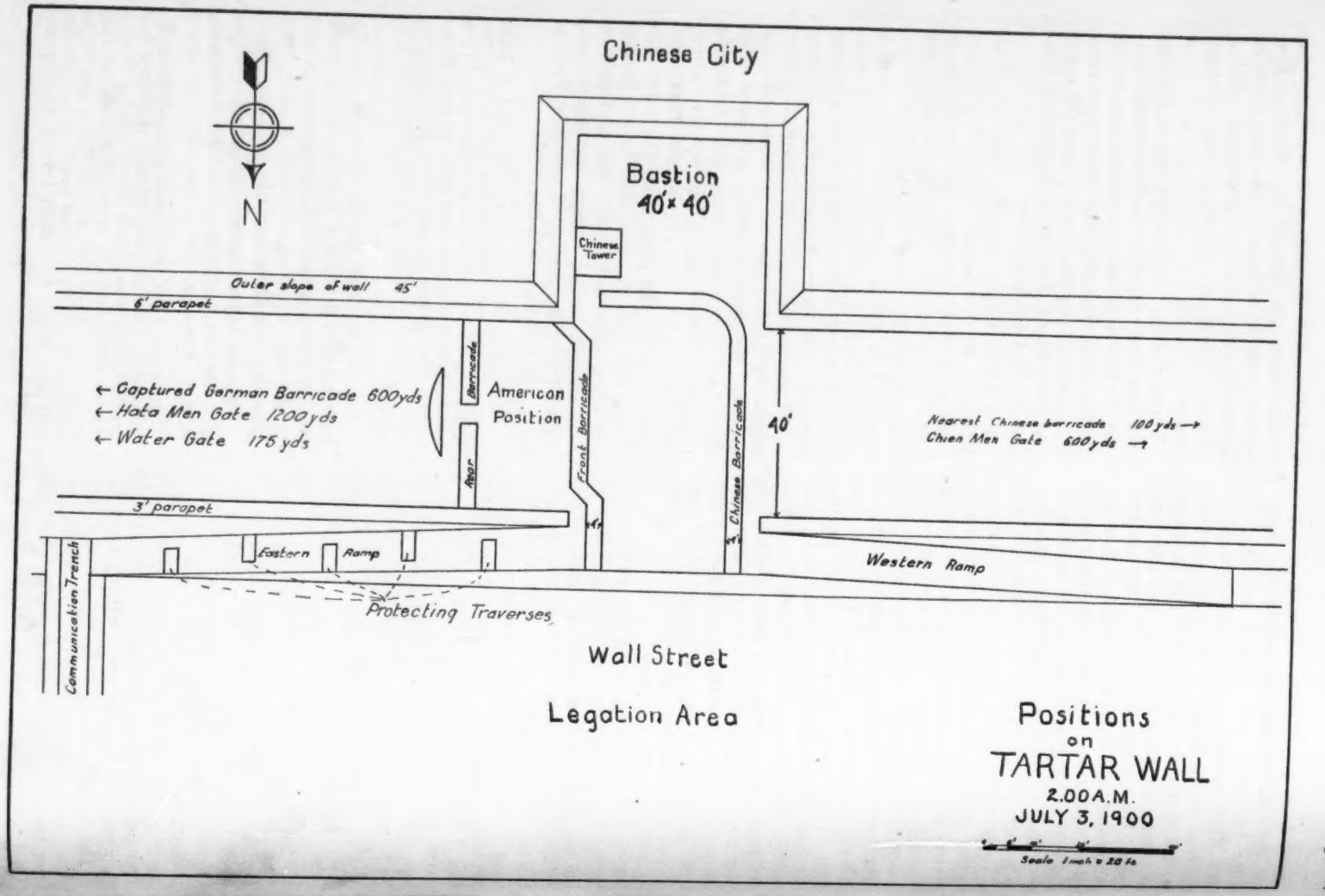
The Chinese now began to close in on the defenders of the wall. Toward noon on June 30 it was reported that the Germans could not hold their part of the wall. Of their small force four were killed and three wounded in quick succession. The British rushed up reënforcements and two of these were wounded, but for the time the German barricade was held. Opposite the American barricade, the Chinese, with infinite cunning, began to build a barricade from near the head of the western ramp, not more than thirty or forty feet from the American position. They came up the western ramp, protected from fire from the barricade, broke through the parapet on the north side of the wall, and, lying on their bellies pushed out brick after brick until they had protection enough to get behind the partly projected barricade and build on top. Private Lewis R. Gaiennie tells us:

> They (the Chinese) seemed to have a large piece of sheet iron, four or five feet long by two feet high, three-quarters of an inch thick. They would shove it out and then build up with bricks behind this, then again shove out the iron plate and so build about two feet high, then they built on this.

All the marines could see were stealthy hands pushing out the bricks. There were no doubt casualties to Chinese fingers and hands, but what a difference a few hand grenades would have made.

Captain Myers' messages to Mr. Conger now began to tell the story. At 8:00 A.M., on July 1 he writes:

> Quiet last night, but sounds of work from the barricade. This morning showed that they had greatly strengthened their work, raising it to a height of twenty feet with three rows of loop holes. They have also made a double gun pit of sandbags in the right center and I suppose the gun will open soon. Last night Private Tutcher was killed.



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The wall was not quiet long. At 9:00 A.M. the Chinese opened up on the German barricade with field pieces at point-blank range. The Germans and the three British marines who happened to be on the wall with them had no choice and retreated down the ramp. This left the rear of the marines entirely unguarded, and when Captain Myers saw the Chinese climbing over the German barricade and the defenders going down the ramp he ordered the marines off the wall to prevent them from being caught between two fires. Once more the inexplicable ways of the Chinese saved the situation. There was no concerted action. The Chinese in front of the marines remained behind their barricade and those in rear did not advance beyond the captured German barricade. Captain Myers hastily conferred with Mr. Conger, and with the assurance of reënforcements, he immediately retook the position on the wall. The Germans were unable to recapture their lost barricade, as the Chinese were occupying its reverse side and the head of the ramp leading to the wall. Captain Myers' position was precarious now. He put all available men to work erecting a barricade a few yards in his rear to protect him from fire from the captured German barricade. He wrote Mr. Conger:

If the back street (wall street) is not held or commanded back of the German legation this place is cut off as the ramp is commanded for two hundred feet by the back street as well as by the wall and the other ramp. If they advance on me from the Hata Men tonight we are between two fires. . . . . If some others would come up and hold the wall one hundred yards in my rear, it would help matters. This must be done at once. Every one of my men are hard at work.

Help soon came. Mr. Conger referred Captain Myers' request to Sir Claude MacDonald. Sir Claude wrote Mr. Conger:

At all hazards the wall at the American legation must be held. In accordance with Captain Myers' suggestion I am sending over every available coolie and sandbag in the place and have also sent ten of my men to help hold the wall.

Captain Wray with ten British marines was the answer. The coolies may be discounted as they could not be made to work under fire on the wall. With the loan of four men from Captain Myers, Wray started to push a barricade across the wall two hundred yards in rear of the American position. Four hours of exposure to cross fire (the bullets from the direction of the Ch'ien Men were just clearing the American barricade and ricochetting along the wall), and a wound in the shoulder, convinced Captain Wray that the attempt was hopeless at the time.

Captain Myers was badly in need of rest, but was loathe to leave the wall. Sir Claude MacDonald had intended that he be relieved by Captain Wray, but Captain Myers remained with the latter and, of course, when Captain Wray was wounded, could not leave the wall. Mr. Conger wrote Captain Myers:

Sir Claude MacDonald, who has been unanimously chosen to exercise supreme command here, directs me to inform you that he peremptorily orders you to be relieved by Captain Hall for tonight and come off the wall and take the rest which you must have. I have instructed Captain Hall to hold the wall at all hazards and at any sacrifice.

Company officers were getting scarce now and the duty was becoming arduous for those remaining. In accordance with the above directions Captain Hall relieved Captain Myers the night of July 1.

The Chinese continued to push their new barricade across. Captain Hall's messages to Mr. Conger tell the story in part:

Will you please have a man kept in the upper story of the office building where he can observe the enemy's barricade and let us know from time to time what they are doing? . . . . We could hear them working and jabbering almost on top of us and sleep was out of the question. [And again] They are working into us on a diagonal line. [By curving the barricade into the bastion in the direction of the American barricade, the Chinese had succeeded in getting in very close. Captain Hall writes again] They are now stoning us, as yet without effect. . . . . I think the coolies could work on the ramp now.

Since the Germans had abandoned the wall, the eastern ramp leading to the American position was exposed to fire from the direction of the Hata Men. As this ramp was now the only approach to the wall remaining in the hands of the Allies it was essential to protect it from enfilading fire. Coolies were pressed into service to dig bricks from the side of the wall and erect traverses up the ramp, so that men mounting the wall might be exposed to a minimum fire. This work could only be done at night, and even then the coolies were in mortal terror.

In other parts of the legation area things were going badly. The Fu palace grounds defended by the Japanese were rapidly becoming untenable. They had already trans-

ferred all provisions to the British legation in anticipation of a probable withdrawal. The wearing tactics of the Chinese were beginning to take effect. With their superior numbers they apparently thought that by continual hammering and sniping they would be able to so reduce the defenders that it would be possible to overwhelm the remainder without undue loss to themselves. Their previous experiences had taught them that rushing the defenders was disastrous.

About 6:00 P.M., July 2, Captain Myers relieved Captain Hall. It was immediately evident to him that his position was perilous. He forthwith dispatched a message to Mr. Conger:

> They are now building into the bastion as I told you I feared they would. The situation is more grave than ever. We will hold on until we give out. [And again] They have done what I expected and built *into* the bastion on my left front, which renders this place absolutely untenable, as they now have an oblique fire right into and behind my work, if they have sense enough. We must watch them, hence the men get shot at the loopholes. . . . . They certainly can shoot. . . . .

From where they had broken through the western ramp the Chinese extended their barricade across the wall to the western edge of the bastion on the left front of the marines. They then changed the direction of their barricade and built diagonally across the front in the direction of the eastern face of the bastion which was in an extension of the marine barricade. There was no way to get at them by fire from this barricade. The barricade had been hastily constructed under fire. Its loopholes, which had been inserted, had no splay and prevented fire from being delivered to the flank. To lie on top of the barricade exposed the men to fire not only from the enemy barricade, but from the tops of houses and trees in the vicinity.

The Chinese barricade was not pushed all the way to the eastern face of the bastion, but under cover of this face, the Chinese began building a stone tower. This tower was practically a prolongation of the marine barricade and when high enough would give the Chinese a plunging fire into the American position. There was no longer room for both the Chinese and the marines on the wall.

Upon the receipt of Captain Myers' messages, Mr. Conger and Sir Claude MacDonald saw the gravity of the situation. The wall could not be abandoned. As Sir Claude expressed it: "His post on the wall *is the peg which holds the whole business together* and the moment that peg is taken out the enemy will flood the wall . . . . the women and children will be shot down in a very short space of time." After a conference with the Russian minister, it was decided to send twenty-five British marines and fifteen Russians as a reënforcement to enable Captain Myers to assault the Chinese position. Some of the messages passing from the wall to the legation and back again are missing, but there was preserved the scribbled note to Mr. Conger sent by Captain Myers just before he made the assault. He had been asked to make a sortie in the dark, against a well-fortified Chinese position, concealing an unknown number of the enemy who could be quickly reënforced; a position which if not taken before daylight would have been extended far enough to completely enfilade his own position and make the wail untenable. His brief answer was: **"We Will Do Our Best."** This message did not convey any expression of over-confidence, but it did convey determination against great odds.

The details of the assault were left to Captain Myers. Between 2:00 and 3:00 A.M. the reënforcements arrived. Quickly and quietly the plan was explained. All were impressed with the seriousness of the undertaking, that the lives of the women and children depended upon the success of the venture. The Russians, called "Rusky" or "Cossaque" by the marines, although they understood not a word of what Captain Myers was saying, gathered the full import of his meaning by his gestures. The British and American marines were to go over the left of the barricade, rush in between the tower and the Chinese barricade which had been extended almost to the eastern face of the bastion, then along in rear of this protecting wall to the rear of the Chinese barricade fronting the American position. The Russians were to go over the right of the American barricade, take the Chinese barricade where it joined the ramp and support the Americans and British coming around from the other side. The Chinese had practically completed their tower on the left flank of our position and were now amusing themselves by throwing large stones down among the marines. It was imperative that the tower and barricade be taken before they

opened with rifle fire. Carefully the American barricade was breached to facilitate going over the top. All hands crouched behind awaiting the word to go. When all were in place Captain Myers gave the word "Go!" and over they scrambled. Two Chinese sentries guarding the opening between the tower and the extension of the Chinese barricade were bayoneted and the assaulting party rushed around in rear of the barricade. By this time the Chinese were blazing away from the loopholes at the rapidly emptying American barricade. But they had no intimation that the attack was coming around by the extension of their barricade. Before they could make a stand they were picked off from behind. When day broke, dead Chinese were found at each loophole, evidence of the accuracy of the fire. Fire was also poured into some tents or lean-to's in the rear of the barricade. Those who were not killed fled down the ramp or back to the next barricade. In the rush Captain Myers had felt a sharp pain in his right knee. He shook his leg, found it sound, and continued on, but afterward he discovered that he had received a spear wound just below the knee. Taking up a position in the bastion, he continued to direct the operation, and at the same time sent down for Captain Hall to relieve him in order that he might obtain medical treatment.

Corporal Hunt was directed to reverse the Chinese barricade and prepare it for defense. He says:

> Shortly after he was wounded, while he was in the bastion between our barricade and that of the Chinese, Captain Myers called me back and told me to take charge, to go ahead and clear the front of the Chinese barricade, and then to man it from the rear, the east side, and then to clear the ramp also, after this report to him. After we had done this I reported the fact to Captain Myers.

He had done his best and now Captain Myers left the wall for the last time.

The rout of the Chinese had been complete. Lieutenant Colonel Ma was killed in his tent in rear of the barricade, as well as about thirty of his soldiers. Three standards, numerous rifles, and a quantity of ammunition were also captured. Henceforth, Fort Myers, as the men termed the American position, was secure, and was never again seriously threatened. Each sortie of the Allies made the Chinese still more hesitant about rushing the barricades. Moreover, this sortie proved to be the first really successful one which had been made. Its successful termination was the turning point in the defense of the legations.

It was not without its cost. Two of the best men in the marine detachment, Privates Turner and Thomas, were killed; and Captain Myers was wounded. His wound became infected and his condition was complicated with a serious attack of typhoid fever. Corporal Gregory, of the British marines, and one Russian were also wounded. Considering the Chinese losses and the results accomplished, the cost was not heavy.

The Chinese now were more loathe than ever to expose themselves and with diabolical ingenuity began to mine the positions of the defenders. At any time on the wall the men could put their ears to the ground and hear the sounds of the tunneling. In some places countermines were started. In the French legation a deep ditch was dug around the position. This was not done, however, until the Chinese had blown up a part of the French position with considerable loss to the defenders. Listening to mining operations was not soothing to men whose nerves were already at the breaking point.

The Germans had never recaptured their position on the wall, so the marines gradually erected traverses in the direction of the old German position. By July 12 a barricade had been pushed across the wall about two hundred yards in rear of Fort Myers. This became Fort Hall. The water gate under the wall was now fully protected.

On July 16 came the armistice, unsolicited, but more than welcome. Today, as then, it is difficult to fathom the reasoning of the Chinese, but the legations at that time welcomed any measure which would preserve their ammunition supply and lessen the ever-recurring casualties. The donations of fruit and vegetables sent by the Yamen were gladly received, but the attempt of the Chinese to fraternize was embarrassing and had to be curbed. However, the day of the beginning of the armistice was saddened by the death of Captain Strouts, of the British marines, who had served as chief of staff, and of Private Fischer, of the American marines.

The Chinese soldiery was not under very strict control and intermittent firing went on between the lines. Word came that the relief column was starting from Tientsin on

July 20. As the column approached Peking more and more of the Imperial soldiers were driven into the city and the fire became more severe. By August 12 it was terrific. The Chinese were taking a last fling at the defenders and, had they had the courage to make a concerted assault on the legations, they might have succeeded because of their overwhelming numbers. After some days of distinctly heard cannonading, the relief column appeared on August 14. Through the water gate under the wall which had been guarded so long came a troop of Indian Sikhs. Then from all directions came the troops of the Allies. The work of the defenders was finished.

Work well done has its reward. After the lifting of the siege the American missionaries unanimously resolved:

> The Americans who have been besieged in Peking desire to express their hearty appreciation of the courage, fidelity, and patriotism of the American marines, to whom we so largely owe our salvation. By their bravery in holding an almost untenable position on the city wall in the face of overwhelming numbers, and in coöperating in driving the Chinese from a position of great strength, they made all foreigners in Peking their debtors, and have gained for themselves an honorable name among the heroes of their country.

In forwarding this resolution to Major W. P. Biddle, then commanding the marines in Peking, Mr. Conger wrote: "I most heartily and sincerely join in this expression and beg you to communicate to both officers and men my personal commendation of, and gratitude for, their heroic and faithful services." On August 17, in his report to the State Department, Mr. Conger says in part:

> To our marines fell the most difficult and dangerous portion of the defense by reason of our proximity to the great city wall, and the main city gates over which the large guns were planted.
>
> Our legation, with the position which we held on the wall, was the key to the whole situation. This given up, all, including the Chinese Christians, would at once be driven into the British legation, and the congestion there increased by several hundred. The United States marines acquitted themselves nobly. Twice were they driven from the wall, and once forced to abandon the legation, but each time, reënforced, immediately retook it, and with only a handful of men, aided by ten Russian sailors, and for a few days by a few British marines, held it to the last against several hundred Chinese with at least three pieces of artillery.
>
> The bravest and most successful event of the whole siege was an attack led by Captain Myers, of our marines, and fifty-five men—Americans, British and Russians—which resulted in the capture of a formidable barricade on the wall, defended by several hundred Chinese soldiers, over fifty of whom were killed. Two United States marines were killed, and Captain Myers, and one British marine, wounded. This made our position on the wall secure, and it was held to the last with the loss of only one other man.
>
> I cannot close this despatch without gratefully mentioning the splendid service performed by the United States marines, who arrived here on May 31, under command of Captain Myers. With slight exceptions their conduct won the admiration and gratitude of all, and I beg you to kindly communicate the fact to the Navy Department.

Communicating personally to Captain Myers, Mr. Conger says:

> Congratulating you on the recovery from your dangerous illness and the early prospect of getting away from the scenes of your sad experiences, I cannot let you go without expressing to you the profound gratitude of all the saved for the incomparable part you took in their salvation.
>
> Yours was a most trying position from the start. Our fate depended upon holding the wall. It could not have been held except for your heroic and successful charge of July 3, when you received your ugly wound. For the brave men who fell upon that and other occasions we grieve with you, and shall always honor their memory.
>
> I beg you to convey to your men an expression of our highest appreciation and sincerest gratitude for all they so nobly did and so bravely endured on our account.
>
> For myself, please accept my warmest personal thanks and very best wishes for all your future.

England's tribute is cast in enduring bronze. Today, on the Royal Marine Tableaux near the Admiralty, is a touching reminder of that feeling of comradeship which existed between the two marine corps during the Boxer Uprising. In bas-relief is depicted the sortie of the Americans and British in the early morning hours of July 3, 1900. A close examination of the figures will disclose that the officer leading the sortie wears a felt hat. The British marines wore helmets. In 1918, Major Wray, writing of this bas-relief, stated:

> Halliday* and I were asked by the Royal Marine Memorial Committee to select what we considered to be the most important and successful operation in which our men took part, and we selected this episode. We had to resist the sculptor's efforts to make the officer leading, British (which he did in the rough), so as to be historically accurate and as a gentle touch of our admiration for Captain Myers and his guard. The officer depicted is therefore Myers.

The sculptor might appropriately have captioned this piece with the words of the leader of the sortie, **"We Will Do Our Best."**

* Now lieutenant general and adjutant general of the Royal Marines.

Latitude *and* Longitude *from a* Simultaneous Observation *of* Altitude, Azimuth *and* Time

By S. A. VINCENT

FOR some years the writer has urged the improvement of the gyro-compass to the point where the azimuth of celestial bodies can be observed to within one or two minutes accuracy. The Sperry people have even bettered these requirements in the new fire-control gyro, as described in the June, 1928, issue of the PROCEEDINGS.

By obtaining the altitude, azimuth, and time of a celestial body, both the latitude and longitude may be readily calculated from this one observation. The orthodox methods involve two lines of position intersecting at somewhere near a right angle, as the result is apt to be unreliable if the angle is too acute. The usual necessary delay between observations to accomplish this necessitates corrections for the ship's movement between observations, as well as the lack of a definite "fix" until the completion of the second observation.

Mr. Edward J. Willis' ingenious revised method of calculating latitude and longitude from a triple observation of the time required for a given change in a celestial body's altitude, gives a "fix" and requires not over twenty minutes between the first and last observation. The azimuth is calculated instead of observed, by this method. The basic principle by which a "fix" is calculated from a single observation is as follows. The altitude determines the diameter of a definite circle of position, the center of which is found from the time and declination. The azimuth gives the position of the observer on that circle of position. To distinguish from the other methods I have called this "Vincent's Method" in previous articles on the subject.

Given the altitude, azimuth, declination, and time, several solutions for latitude and longitude are possible. Should the method come into general use condensed tables can be prepared to shorten the work.

VINCENT'S METHOD

For Longitude:

$$\sin t = \sin Z \cos h \sec d.$$

For Latitude:

$$\tan \tfrac{1}{2} (90° - L) = \sin \tfrac{1}{2} (t+Z) \operatorname{cosec} \tfrac{1}{2} (t-Z) \tan \tfrac{1}{2} (h \pm d)$$

using the usual Bowditch nomenclature, viz.: h=corrected altitude, L=latitude, d=declination, t= local hour angle, and Z=azimuth. Note: in the equation for latitude, use $(+)d$, if L and d are of opposite names, and use $(-)$ d if of the same name.

The effect of errors in observation upon the calculated position, are as follows:

(a) A moderate error in time will affect the longitude only, and at the rate of one minute of longitude for each four seconds error in time.

(b) An error in altitude will affect the position in the direction of the line of azimuth, and at the rate of one nautical mile for each minute of error in altitude.

(c) An error in azimuth will affect the position in a direction at right angles to the line of azimuth; and for each minute azimuth error, the true position will be one nautical mile multiplied by cos h. Obviously the worst error in position due to an error in observed azimuth will be one mile for one minute error, which is the case at very low altitudes.

This method may also be used conveniently to find latitude from an assumed longitude, with an observed altitude and time.

This will be found useful where the navigator prefers, under special conditions, to substitute an "assumed" longitude instead of the more usual "assumed" latitude, in plotting a Sumner line of position. For this purpose the formulas may be rearranged as follows:

$$\sin Z = \sec h \cos d \sin t$$

$$\tan \tfrac{1}{2}(90°-L) = \sin \tfrac{1}{2}(t+Z) \operatorname{cosec} (t-Z) \tan \tfrac{1}{2}(h \pm d).$$

Example: To find latitude and longitude from the following:

Given $h = 24° 41'.6$, $d = 18° 54'.1$ S, and $Z =$ N 131° 10′ W.
Greenwich A.C. Time = 20 h. 47 m. 4 s., or 131° 46′.0 W.

For longitude:

log sin 131° 10′.0 = 9.87668
log cos 24° 41′.4 = 9.95836
log sec 18° 54′.1 = 10.02407

log sin t = 29.85911 ∴ t = 46° 17′.9 W.
131° 46′.0 W.

From G.A.C.T.

Ship's Longitude 85° 28′.1 W.

For latitude:

½(46° 17′.9 + 131° 10′) = 88° 44′.0, log sin = 9.99989
½(46° 17′.9 − 131° 10′) = 42° 26′.0, log cosec = 10.17087
½(24° 41′.4 + 18° 54′.1) = 21° 47′.8, log tan = 9.60195

log tan ½(90° − L) = 29.77271
∴ ½(90° − L) = 30° 38′.9
∴ Latitude = 28° 42′.2 N.

Example: To find latitude, from altitude and an assumed longitude.

Given t = 4 h. 28 m. 28 s. = 67° 7′, d = 52° 38′ S., h = 35° 7′.5

For azimuth:

log sec 35° 7′.5 = 10.08730
log cos 52° 38′ = 9.78313
log sin 67° 7′ = 9.96440

log sin Z = 29.83483 ∴ Z = 43° 7′.8

For latitude:

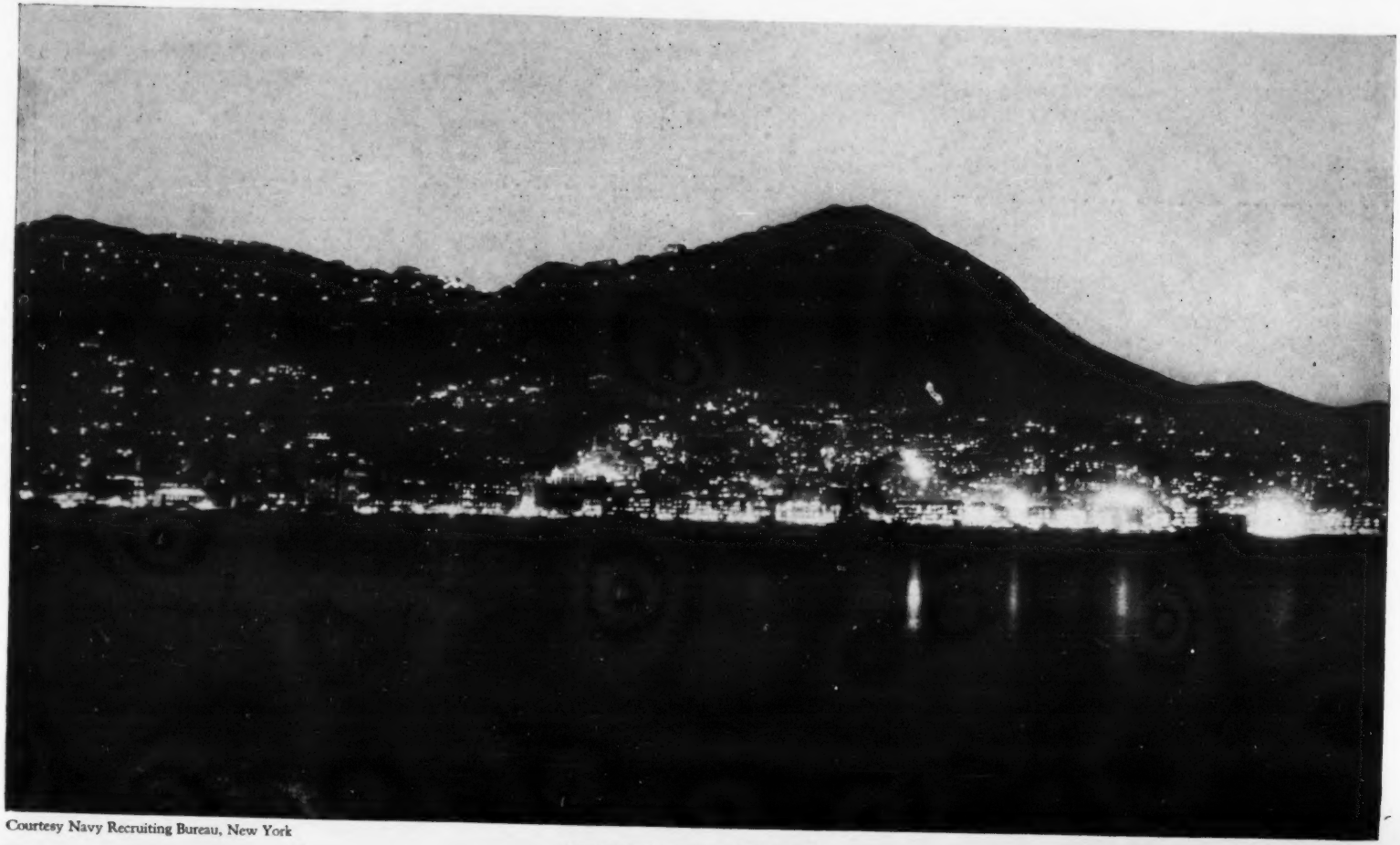
½(67° 7′.0 + 43° 7′.8) = 55° 7′.4, log sin = 9.91402
½(67° 7′.0 − 43° 7′.8) = 11° 59′.6, log cosec = 10.68236
½(35° 7′.5 − 52° 38′) = 8° 45′.25, log tan = 9.18749

log tan ½(90° − L) = 29.78387
∴ ½(90° − L) = 31° 17′.86
∴ Latitude = 27° 24′.3 N.

Courtesy Navy Recruiting Bureau, New York

HONGKONG HARBOR

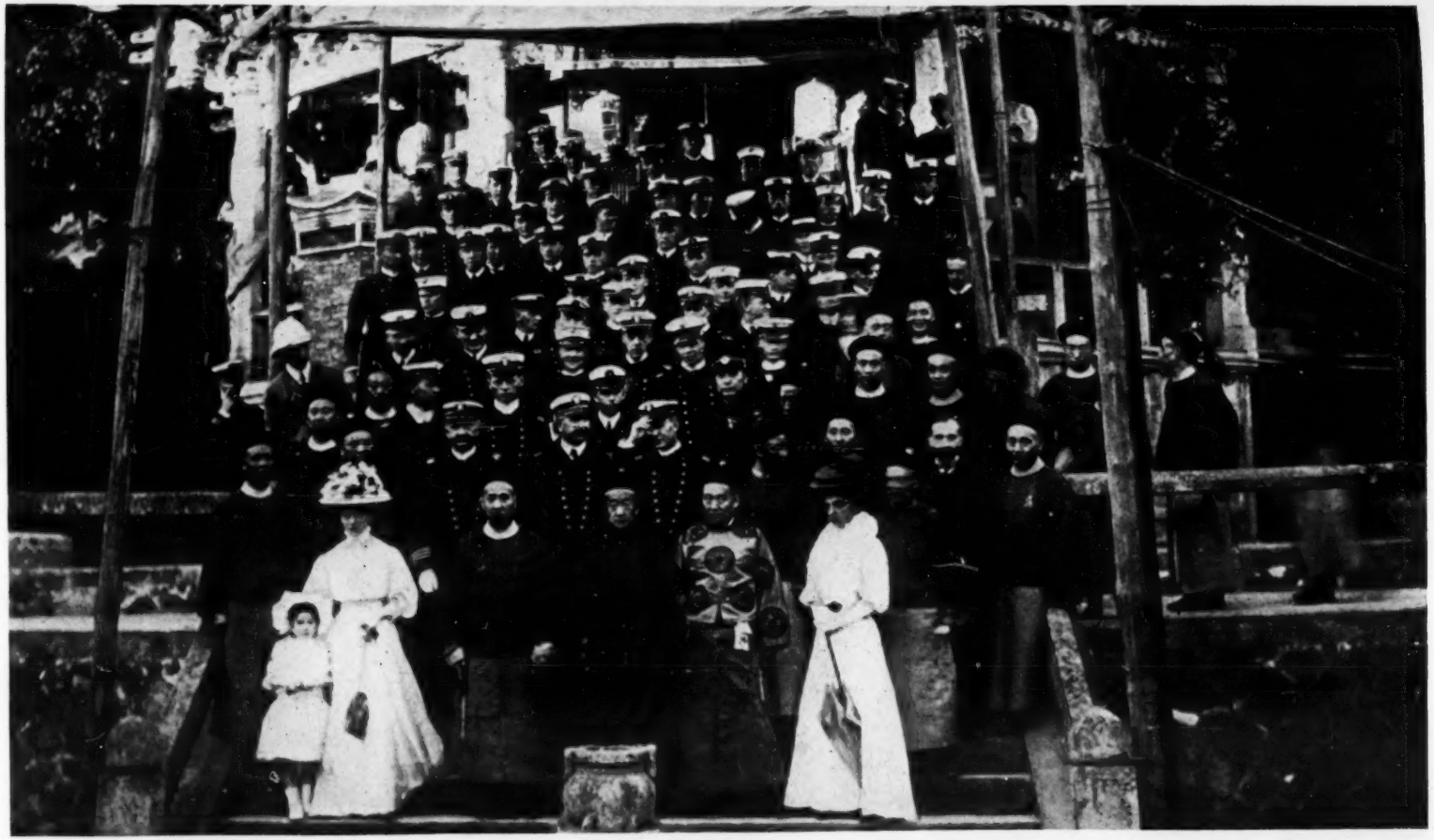
Where the first squadron of the battleships were entertained in 1908—on the cruise around the world.



Courtesy Navy Recruiting Bureau, New York

HONGKONG HARBOR AT NIGHT

HONGKONG HARBOR AT NIGHT



Courtesy the late Mrs. G. E. T. Stevenson

OFFICERS BEING ENTERTAINED
Hongkong, China, in 1908.

Courtesy the late Mrs. G. E. T. Stevenson

OFFICERS OF THE SECOND SQUADRON, U.S. BATTLESHIP FLEET
Being entertained at Amoy, China, in November, 1908.

OFFICERS OF THE SECOND SQUADRON, U.S. BATTLESHIP FLEET
Being entertained at Amoy, China, in November, 1908.

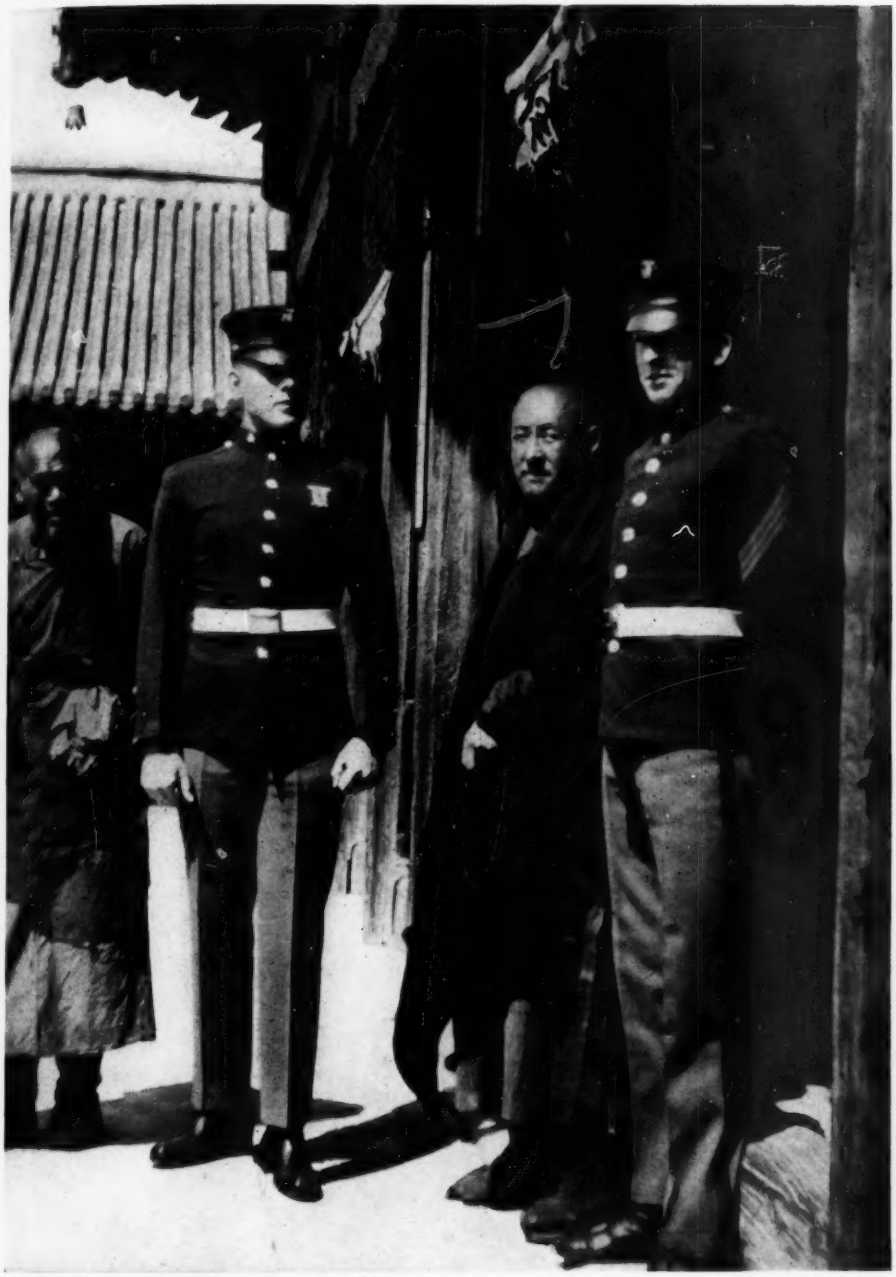
Courtesy Mrs. H. A. Baldridge

A GIFT FROM THE EMPRESS DOWAGER OF CHINA

A picture of one of the cloisonné vases presented to the officers of the fleet in 1908. The vases were made by special instruction from Her Majesty.

Courtesy Marine Corps Recruiting Bureau, Philadelphia

A CHINESE TAXI



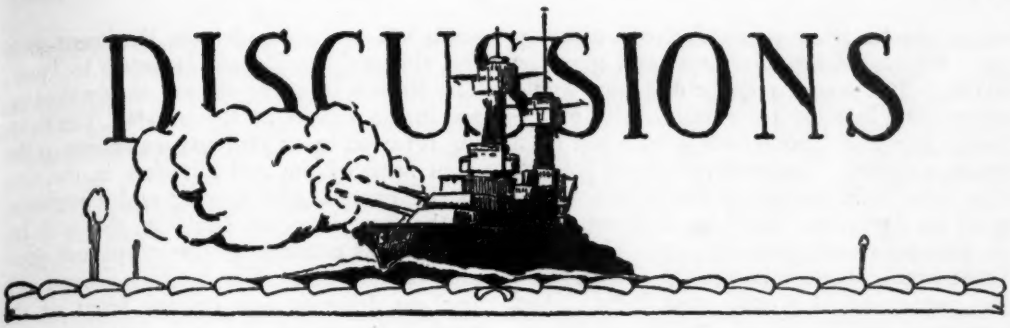
Courtesy Marine Corps Recruiting Bureau, Philadelphia

U.S. MARINES VISIT LAMA TEMPLE

U. S. MARINE AT MING TOMB IN CHINA

Courtesy Marine Corps Recruiting Bureau, Philadelphia

DISCUSSIONS



U. S. MARINE AT MING TOMB IN CHINA

The Battles for the Possession of Belleau Woods, June, 1918.

(See page 940, this issue)

CAPTAIN JOHN W. THOMASON, JR., *U. S. Marine Corps, 2nd Division Historical Section, U. S. Army War College.* Colonel Otto, of the Reichsarkiv, is a former officer of the Imperial German Army, and he enjoys a high reputation as a military commentator and historian. His views may be received with respect and confidence; and the professional spirit in which he writes is evident from the translation of this article on the fighting around the Bois de Belleau in June, 1918.

This action, between the American 2nd Division, then serving in the French 21st Army Corps, and the German 4th Reserve Corps, was of peculiar interest to the German observers, since it was the first large-scale engagement between them and their new opponents, the men from across the Atlantic.

It came about in the progress of re-welding the French line, after the Germans breached it in the drive which began on the Chemin des Dames, May 27. The Germans, exploiting that breach, desired to swing their right towards the Ourcq. To this end they required certain positions south of the Clignon Brook to safeguard the flank of the divisions thrusting at the Ourcq and Compiègne. The French corps commander, once his lines were restored, wished the Germans driven north of the Clignon Brook, for the security of his own front.

By June 5/6 the attempts on the line of the Ourcq were stopped. After June 3, the 4th Reserve Corps made no gains south of the Clignon Brook, although it planned further efforts. On June 6, the American 2nd Division began the series of assaults which Colonel Otto calls the "Battles for the Possession of Belleau Woods" and these continued until June 25, the Germans meeting every blow with bitterness and resolution.

The immediate object of this fighting is nowhere better stated than by the commanding general of the German 28th Division, in the foregoing paper. We are not fighting for ground—for this ridge, or that hill, or that village. It will be decided whether or not the American Army will be equal to or better than our own troops.

As to this story of the battle, from the German side, it is fair, and on the whole, accurate. There is some confusion of dates, which is traceable to the records of the German 237th Division; that division, from which most of Colonel Otto's information comes, was shelled out of its headquarters, and had to find a new command post, under difficult conditions, in the early stages of the action. This may possibly account for a little confusion in its records. No attack was made by the marines prior to 3:45 A.M. (French time) on June 6, when the 1st Battalion of the 5th Regiment attacked Hill 142. The first assault on the Bois de Belleau proper was made at 5:00 P.M. that afternoon.

For the rest, in comparing Colonel Otto's account with the records of the American 2nd Division, no very material discrepancy is found. One interesting fact is disclosed in weighing the German and American accounts: many of the attacks, which each mentions as having been made and repulsed, were never made at all. After June 6, the opposed lines were at many places in close contact in thick woods, where observation was strictly limited. Some weary man on listening post peering into the dark from the core of a fearful dream, would imagine Ger-

mans—or Americans—on his front, creeping up. He would fire his piece, and give the alarm. The weary men behind him would shoot blind into the foreground, with everything they had. Somebody would put up a barrage signal. The artillery would join in. The other side, roused by the racket, would send up flares, and start its machine guns; its gunners would also take part. The whole front would blaze up furiously. Then, nothing happening, it would quiet itself. And next morning the front reports an attack, which broke down before it reached our lines, and is so recorded.

Colonel Otto's judgment on the French corps commander, as to the tactical methods of the Americans, is hardly justified. There is no evidence that General Degoutte, of the 21st Corps, gave detailed tactical directions to the 4th Brigade; the attack formation used was the method which had been taught the 2nd Division as doctrine by their French instructors during the training period. It was no doubt adapted to the requirements of trench warfare; it did not do well in the open and this was open fighting.

Colonel Otto comments on the fighting value of the German infantry at close quarters, and his observations tally with the American records. The German foot soldier had ceased to depend on his rifle. As long as the machine guns, light and heavy, kept off the enemy, he stayed, and held together well. But when the assault got through the machine-gun fire, and came to close quarters, he was quite likely to quit or run away. A German regiment, in 1918, had greater fire power than an American regiment, although it had fewer men in it. But for this fire power, it had sacrificed the fighting edge and self-reliance of its riflemen; and at the last, in that war, it was the infantry which won or lost the battles. Colonel Otto mentions, as an unusual event, the fact that certain German regiments in this fighting expended all their small-arms ammunition.

There are a few misstatements, relatively unimportant. The Americans did not resort to the use of German uniforms to enter the German positions; although they did, when practicable, try to reason with Heinie through the medium of German-speaking men. The chances are that those chaps who, says Colonel Otto, called in the Bois de Belleau, "Wo ist das Regiment 40?" were unfortunates lost and strayed from Regiment 40 in the thickets, and really wanted to know. The French infantry did not at any time assist in the attacks on the woods. The fighting referred to on Hill 204 was south of the right flank of the 2nd Division, in the area of the French 38th Corps; and a regiment of the American 3rd Division, the 30th Infantry, was attached to this corps and operated on Hill 204. The fighting around Hill 192, on June 6, was on the front of the 23rd Infantry of the 2nd Division; they were for a while in contact with the German 47th Regiment of the 10th Division. The 7th Infantry of the American 3rd Division relieved battalions of the Marine Brigade in Belleau Woods between June 15/17, and made some offensive efforts on June 20 and June 21. Regarding the attack by the German 28th Division on Bouresches, on June 13, the 1st Company of the 109th Regiment did enter the town. But the only Germans left in it, when the 1st Company retired, were dead and prisoners.

I think that every man who fought in the battles for the possession of the Woods of Belleau would be glad to see erected such a tablet as Colonel Otto describes in his last paragraphs.

A Naval Research Reserve

(See page 976, this issue)

Dean Frank H. Probert, *College of Mining, University of California.*—I have read with great interest the paper of Captain C. S. McDowell, U. S. N., proposing and, by sound argument, justifying the creation of a naval research reserve. It is timely, constructive, and convincing. As a naval officer his thought is focused on the betterment of the service to whose cause he is devoted. Yet with larger vision he foresees the benefits that would accrue to industry and humankind by competent organization of our scientific resources and the effective marshaling of these potential energies into a working force. The article will command respect; it deserves purposeful consideration.

Much has been written and spoken of late concerning research. The subject appeals to all manner of people, though there be a protracted controversy as to the pronunciation of the word and even wider divergence of opinion as to the nature of the field of

investigation that properly comes within its purview. Research implies sounding the uncharted depths of truth, to do which the researcher must have an inquiring mind, skill in experimentation, accuracy of observation, powers of inference and deduction, the ability to translate and interpret, and to weigh the import of results. Methods of research demand an impartial attitude toward evidence and a fearless judgment upon it. Research workers are the vedettes on the frontiers of philosophical thought. Unfortunately the term is both abused and misused; it is often prostituted by pretention. I like to quote the words, uttered a century ago by De Witt Clinton, governor of New York and advocate of the building of the Erie Canal:

> The active mind is always vigilant, always observing. The original images which are created by a vivid imagination, the useful ideas which are called up by the memory and the vigorous advances of reasoning power into regions of disquisition and investigation, furnish full employment for the most powerful mind. If there is anything in this world which can administer pure delight it is when we summon our intellectual resources, rally our mental powers, and proceed to the investigation of a subject distinguished for its importance, its complexity, and its influence on the destinies of man.

To Captain McDowell's suggestion I heartily subscribe, and in the spirit of inquiry am constrained to ask that the idea be transformed from the abstract to the concrete, from the amorphous to the crystalline, and that program rather than policy be clearly set forth. What are the problems before us; what is their nature, significance, import, and purpose? From a detached viewpoint it appears to me that all branches of philosophic and scientific thought pertain directly to naval matters—optics and oceanography, physics and psychology; anything within the alphabetical gamut—aëronautics to zoölogy; everything within the range of raw material to finished product—from mine to battleship. To encompass the realm of thought leading to knowledge, is an ambitious concept which inevitably will lead to confusion; hence the prime necessity, to which McDowell calls attention, of the clarification of issues, classification of data, coördination of effort, and card-indexing of projects.

A centralized depository for ideas, problems, projects, data of all kinds relating thereto, should first be established, to which all branches of the service and those connected therewith might have access.

We should not belittle theories or hypotheses. Many beautiful ideas are killed by ugly facts, and while the theories of bygone summers have fallen as leaves from a tree stripped by the biting blasts of cold criticism, yet while they lived they added nutriment to the parent stem of knowledge.

Detailed files containing pertinent information as to current knowledge, experience, experts, equipment, and laboratory facilities would expedite inquiry, avoid duplication of effort, and inspire investigation.

A synoptic review of current work might with advantage be circularized periodically in order that all concerned be advised of the character of work being done, and progress made, thus being kept abreast of the research wave. All should be free to contribute advice or discussion through properly organized channels, or by visitation or personal correspondence. Collaboration should be the keynote to the naval research reserve.

The Navy Department is most intimately acquainted with its own problems, and cognizant of its limitations in the solution of them resulting from inadequacy of funds, facility, or personnel. It is apparent then that in so far as is possible, the centers of research activity should be conveniently located to the centers of naval concentration. Proximity to established navy yards or headquarters of commandants of divisional areas would enable lay researchers to acquire the vernacular of the Navy, to more completely visualize the point and application of their work, and fully and intimately discuss with the regular officers every phase and aspect of the inquiry. Both on the Atlantic and Pacific coasts educational institutions of high standing well equipped with facilities, libraries, and laboratories, are within the easy reach of naval headquarters, wherein a wealth of information and a host of able men may be drafted into the naval research reserve corps.

Rank, recognition, and remuneration are probably matters of small concern to the first-line officers of the proposed naval research reserve, though perhaps even here organization is desirable. Much of the actual work, however, must of necessity be done by assistants and subordinates, for whom adequate recompense should be provided

consistent with their standing and contribution.

Captain McDowell suggests the establishment of research fellowships for students of exceptional promise and intelligence. It is the ideal method, though not always successful. Many universities maintain such fellowships and not infrequently they go begging for want of applicants of proper mental caliber. Great care must be exercised in the selection of young men for research, for, alas, there are all too few who willingly will sacrifice themselves on the altar of science. There is no magic in learning, no royal road to knowledge. The goal is attained only by laborious effort, and the prize, measured by the common standard, not very attractive. Frequently drudgery, exasperation, and want are the companions of wisdom, and few youngsters appreciate that the true interest of knowledge lies in its growth. As an alternative I suggest that federal appropriation be made to provide funds upon which authorized parties could draw to secure such assistance, student or otherwise, as might be desirable. It may develop that both suggestions would prove effective.

It is proposed to organize divisional groups—an excellent idea. It engenders *camaraderie,* saves time, and concentrates strength and resource. Occasional meetings for conference, either casual or compulsory, could be arranged, and by the interchange of ideas, new light might be brought to bear upon the problem in hand.

Already there are many federal and state bureaus and other organizations, busily engaged in varied investigations. Duplication of effort and overlapping of authority is not uncommon, hence the desirability for a centralized office for formulation of policy and program, allocation, and assignment of work. The National Research Council would, I feel, gladly share in the task, and coöperative agreements could be made with existing bureaus. And I say without fear of contradiction that our universities will not only endorse McDowell's proposal, but unhesitatingly devote their facilities and faculties to its furtherance.

A Naval Research Reserve

(See page 976, this issue)

CAPTAIN C. W. NIMITZ, *U. S. Navy.*—Any scheme which will classify and make available for the use of the Navy the information obtained in the 999 industrial research laboratories and the numerous university and college laboratories of the country deserves the whole-hearted support of the government—particularly if such a scheme also provides for special attention to problems intimately connected with naval methods and materials.

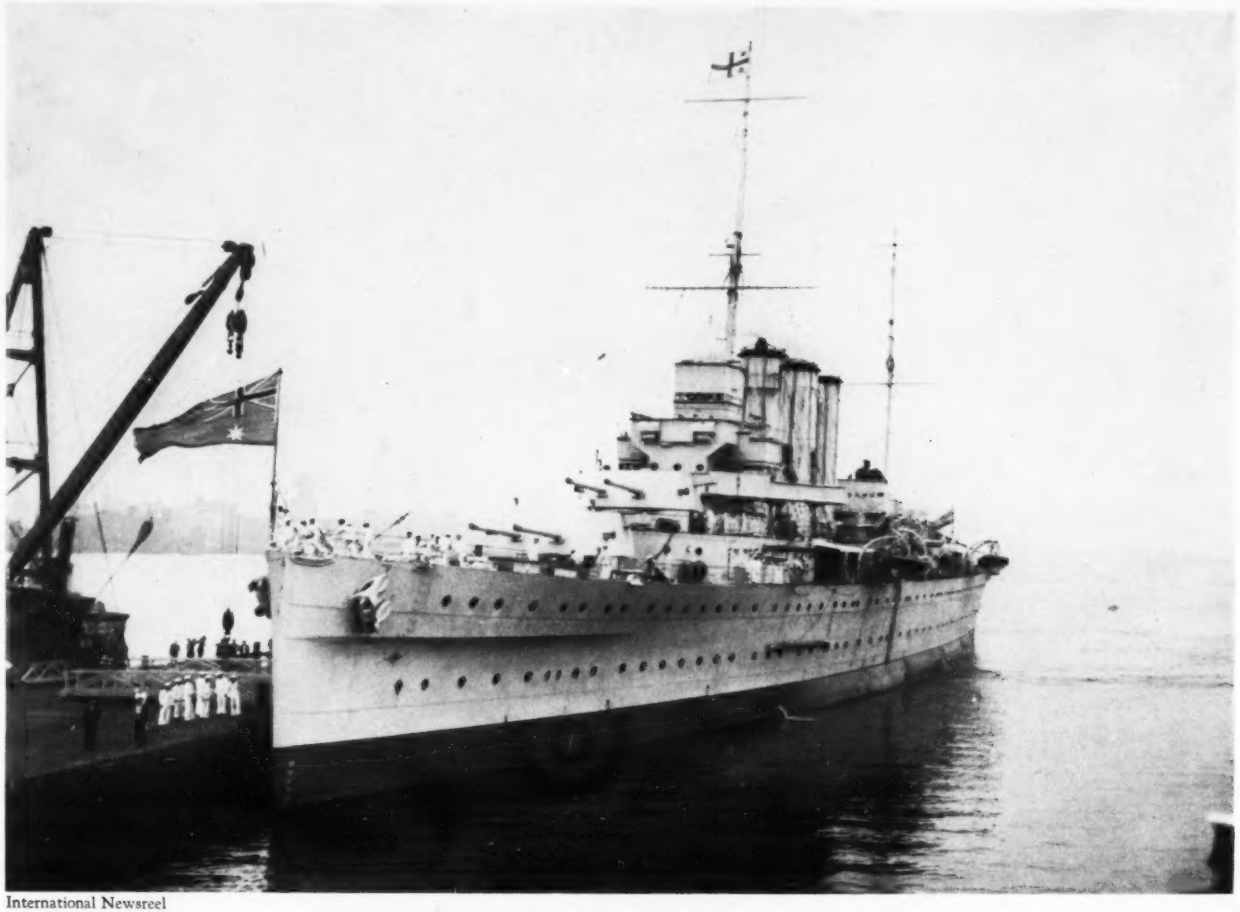
The organization and administration of such a reserve will present many problems which, though difficult, are capable of solution. Our experience during the World War with the special board on anti-submarine devices would indicate that a high-ranking naval officer should control all activities of the scientists and preside at meetings. For instance, the head of Bellevue Laboratory should preside at meetings of a central organization at or near Washington, while naval officers in the various districts should perform similar duties in the local organizations. Such procedure is very necessary to provide the naval background and to keep all effort pointed in the right direction. Young regular officers who have had special training along certain lines could assist at much of the laboratory work carried on in the vicinity of their duty or station.

Such an organization should be built up very slowly and with the greatest scrutiny of prospective reserve scientists, selecting not too many of the older men in the various specialties. Promising young men should grow up in the organization and should have opportunities of cruising in order to increase their knowledge of naval matters. Naval fellowships—if granted—should not be awarded on an annual basis, but should be held open until the right man appears.

LIKE HORNETS OVER A CITY

More than 300 planes flew over Los Angeles at the opening of the National Air Races.

International Newsreel



International Newsreel

H. M. A. S. *AUSTRALIA*

Flying the flag of Rear Admiral G. F. Hyde, commanding His Majesty's Australian Squadron. The *Australia* was built in England. She is of 10,000-tons treaty displacement, and is armed with eight 8-inch rifles and four 4-inch A. A. guns.

PICTORIAL

GREAT BRITAIN

FRANCE

UNITED STATES

ITALY

MERCHANT MARINE

ENGINEERING

AVIATION

MISCELLANEOUS

CURRENT EVENTS

PROFESSIONAL NOTES

1 SEPTEMBER TO 2 OCTOBER

COMPILED BY
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LIEUTENANT COMMANDER A. C. MCFALL, U. S. NAVY
AND
PROFESSOR HENRY BLUESTONE, U. S. NAVAL ACADEMY

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of 10,000-tons treaty displacement, and is armed with eight 8-inch rifles and four 4-inch A. A. guns.

GREAT BRITAIN

Completing Singapore Base

New York *Times*, September 29.—Announcement that the contract for the completion of the Singapore naval base has been awarded indicates that the original program laid down in 1921 is to be carried out with only minor technical modifications. Shortly before the Washington Conference the British Government proposed enlarging and strengthening the more or less inadequate docks and storage depots at Singapore, with the purpose of making it the outpost of the British Empire in the Far East. During the discussions at the Washington Conference, when the area in the Pacific east of the 110th meridian was set aside as within the scope of the naval treaty limiting the further construction of naval bases, it was well understood by the Japanese, American and British delegates that Singapore was outside this area and that the base there could be strengthened. Since under the agreement the British forfeited this right to improve their base at Hongkong and Kowloon, it was a foregoing conclusion that they would make Singapore their principal naval station in Eastern waters.

The decision to do this was reached under strong pressure from Austria and New Zealand. In fact, throughout the debates in Parliament about the Singapore base it was stressed that this was an imperial, not a merely English affair. The Dominions were so anxious to see a base at Singapore because there is now no base east of Malta where battleships and large aircraft carriers can be docked for renovation and repairs, and there are no suitable reserves of fuel and other supplies within striking distance of Austria and New Zealand.

The strategic importance of Singapore lies in the fact that it is at the extreme southeastern corner of Asia and that it flanks the chief line of communications between Europe and Eastern Asia and between India and Australia. Just as at Gibraltar and Suez, lines from many different places are forced to converge there. Contrary to the general impression, Singapore is as far from Japan as England is from America. Its sole objective is to enable the British fleet in Asiatic waters to defend the interests of the empire in case of attack. It is no more directed against any one nation than is Gibraltar or Malta. Rather is it a link in the chain of imperial defenses designed to protect communications between the distant parts of the empire and the homeland.

A measure of extent to which the empire is interested in the project is afforded by the fact that Hongkong contributed $1,250,000, New Zealand $5,000,000, and the Federated Malay States also gave a substantial sum of money and all the necessary land. The amount asked from Parliament was $52,500,000. This original estimate has now been somewhat reduced. Up to the present, despite the fact that the MacDonald government withheld further appropriations for work on the Singapore base, much to the distress of the Dominions and colonies in the Pacific, most of the preliminary work has been completed. Storage facilities have been installed and arrangements made to handle the large floating dock which is due to arrive there within a short time, having been towed out from Europe by way of Suez. It is interesting to note that this work has met with the approval not only of the subjects of the British Empire in the Far East but of the Dutch in the East Indies and of Americans in the Philippines. They regard the Singapore base as an essential factor in the preservation of the status quo in that region of the Pacific.

FRANCE

French Air Scandals

Washington *Post*, September 25.—It is possibly a penalty of the present stage of organization of the air service of France that there should have cropped out bitter disputes, with allegations of graft. The definition of "graft" in any case is flexible, and when passion handles the word it is apt to be tossed about with less regard for facts than for vituperation. It may, therefore, be discounted as being part of the political agitation over policies.

The squabble has arisen over the fact that neither the minister of marine nor the minister of war is willing to hand over the air service to the new ministry of air, or to come to agreement as to a common ground of action for the three services. The crux of the quarrel is the fact that the new ministry of air has been created without giving

it effective control of air services. There are three of these—navy, army, and commercial. The new air minister has control only over the latter. With the two military services noncoöperative, all efforts to try out and determine the merits of the various kinds of motors is out of the question.

The moral for this country is that shoals lie ahead of any scheme of unification of air services which is not thoroughly digested and binding upon all concerned.

Comparison of French, English, and Italian Cruisers

J. B. Gautreau in *Naval and Military Record,* August 22.—The 10,000-ton cruiser *Suffren* has just been commissioned for trials at Brest by Captain de Solminihac (fifty-three years of age), a distinguished officer with fine war records and an interpreter for the English language. The *Suffren* belongs to the 1925 program; she was laid down at Brest on May 3, 1926, and launched on the same day of the following year (1927) with a weight of 5,200 tons. Altogether her construction will have required nearly thirty months and has been carried out on economical lines. Economy is the strong point of Brest *Arsenal,* that publishes annually highly comforting progressive economy statistics, tending to show workmen are getting dexterous and engineers proficient at sum-making. The *Suffren,* though a sister-ship to the record cruisers *Tourville* and *Duquesne* in all essentials, has not been built on quite the same lines. The *Tourvilles* are 191 meters long, that is nearly as long as the Italian *Trente* and *Trieste* (195 meters), and some nine or ten meters longer than the British *Kents.* When Paris *ingenieurs de la Section Technique* saw the *Kents* were so short and their own ships of the same displacement so long they had something of a remorse and felt they could not be quite in the right, since they were working in a groove somewhat different to that of their British confrères. They suddenly discovered, at reflection, a lot of drawbacks in extreme length that means increased vulnerability in every way, and a lot of advantages in shortened dimensions, and so they hastened in cutting out some twenty feet out of the hull of the *Tourville* to make the *Suffren.* The latter is therefor only 185 meters long, with a width of 20 meters and a draught of 6.30 meters (the same as in the *Tourvilles*). These 10,000-ton French cruisers are deeper in the water than their British and Italian similars.

The saving thus effected on the weight of the hull of the *Suffren* has been employed in improving, as far as practicable, the all-round protection against gunfire, submarine explosions, and aërial bombardment; but requirements are so very great in those respects that what has been achieved has little more than a moral value. A partial armor belt and carapace encloses the motors and may prove the saving of them against moderate hits and the indirect effect of distant torpedo and mine explosion. Ammunition bunkers and powder magazines have been protected in the same skilful manner. The hull has been divided into seventeen watertight compartments on improved effective lines. Three compartments could be flooded without endangering the stability and floatability of the cruiser. From war experience and subsequent comparative experiments this system means efficacious defense, especially as in addition to athwart bulkheads there is a lot of longitudinal compartmenting, amounting, in some parts of the ship, to internal bulges or caissons. It must be remembered French engineers were the first to try that underwater defense system in the Russian *Cesarewitch* (*La Seyne*) and in the *Dantons.* All points considered, and although she carries very light armor, the *Suffren* would prove more difficult to sink than pre-war *croiseurs cuirassés* of the *Condé* and *Montcalm* classes, that were the French counterparts to the British *Monmouths.* Internal explosions, that proved the undoing of so many fine British cruisers in the last war, have been guarded against to an appreciable extent, Paris constructors never having quite lost from sight that sensitive point in cruiser vulnerability.

Similarly, 8-inch gun turrets have been strengthened in the *Suffren,* especially against aërial attacks and in the front plating. The internal loading and firing installations have benefited with the practical experience gained in the 8,000-ton class of post-war cruisers, and the whole arrangements must be said to be up-to-date. The turrets of the 10,000-ton French *Croiseurs-légers* give, in reality, the impression of being spacious gunhouses, a sure shelter against rain and wind and to a certain ex-

tent against shells and bombs, in which "canonniers" have not to fight for elbow-room and breathing space, and can handle their guns in relative comfort, which makes for quick and accurate firing. In this respect enormous progress has been realized on pre-war French turrets, all the more so as the new turret bases appear to be more stoutly armored than the gun-houses themselves, which is logical enough.

Although the English *Kents* and Italian *Trentes* may differ here and there, they are open to the same criticisms as the *Suffrens*. The Italians, that have greater length and side turrets besides, with unprecedented horse-power (150,000), have every chance to be, defensively speaking, inferior to the *Kents* and also to the *Suffrens*. It is considered in Paris that the British 10,000-tonners are the best protected among Washington standard cruisers, for the twofold reason that substantial saving has been effected on the weight of their hull and motors, and also that the British Admiralty has, since the war and for obvious reasons, given the greater attention to the problem of adequate cruiser protection, sparing no trouble or money to arrive at a satisfactory solution. It is even believed in some quarters where high regard is entertained for British constructional achievements that the continuous sea speed in the English *Suffolks* is not so inferior in practice to that of the French *Tourvilles* as might appear on paper. The high efficiency of British boiler and turbine makers and the hearty coöperation prevailing between English private and naval constructors are the arguments brought forward in favor of that view.

The *Suffren's* best protection will, of course, reside in her gun power and capacities for extreme range firing. She possesses battleship range. When recently tested at Gavres, her 203-mil. weapons were proved to have a maximum range just exceeding 32,000 meters. The shells, of a totally new model combining penetration and wide range exploding power, are intended to be efficient at any range against a lightly armored target. At moderate range no battleship, however well armored, could feel comfortable under a shower of such 125-kilo projectiles—but, of course, the *Suffren* might not be given sufficient opportunity of displaying her aptitudes. She mounts eight 75-mil. weapons available against either torpedo-boats or seaplanes, eight 37-mil. one-pounder guns against aërial targets, and twelve machine-guns, besides six torpedo-tubes of 550-mil. and two catapult folding seaplanes. The tremendous range of the *Suffren's* guns will remain a paper asset so long as aërial fire control specialists have not been formed and are not forthcoming in adequate number for destroyer as well as for cruiser service. The 140-mil. weapons of the 2,700-ton super-destroyers of the *Guépard* class have also battleship range, namely 25,000 meters, being equal to the 155-mil. of the *Duguay-Trouin* class, at a firing angle of forty-five degrees.

The *Suffren* will develop nominally 120,000 h.p., driving three screws. Her eight boilers of the improved Indret type can produce each up to 17,000 h.p. Her turbines are of the Chantiers de Bretagne Rateau type that gave such remarkable results in the *Tigre, Duquesne,* and *Tourville,* and are designed for quick change and rise of speed (one hour and a quarter after leaving Lorient the *Tourville* had reached thirty-five knots). It is a question whether the *Suffren* will prove so wonderful a steamer as her predecessors have done. Her nominal speed is only thirty-three knots. Her builders expect to obtain thirty-five knots at full power. Three more 10,000-ton cruisers are in hand at Brest, viz., *Colbert,* completing afloat, *C2,* on the stocks, and *C3,* just ordered. Thus, in 1931, France will array nine post-war cruisers of 8,000 and 10,000 tons that will, at that time, make up the all-in-all of France's ocean fleet and constitute the sole guard for France's huge colonial empire. The obsolete 24,000-ton *cuirassés* in service that are contemporaries to the long-discarded British *Ajax* class are little more than a coastal force. *Officers de vaisseau* of the old school profess only moderate admiration for the fighting qualities of the new 10,000-ton *croiseurs-légers,* which they describe as being costly make-believe, *"et poudre aux yeux."*

UNITED STATES

Nicaraguan Approaches

New York *Times,* September 24.—Following America's traditional policy of looking forward to the day when the Nicaragua Canal may be built, the State Department has made public the details of a three-sided

arrangement between the United States, Nicaragua and Colombia. It helps to clarify certain disputed points about the jurisdiction over some of the islands in the Caribbean off Nicaragua and over the Mosquito Coast. For more than a century Colombia has claimed not only the Mosquito Coast, which lies on the Atlantic shore of Nicaragua, but the islands and keys lying off it. The Mosquito Coast and the nearest islands and keys, notably Little Corn and Great Corn, which the United States Government had leased from the Nicaraguan Government, are definitely recognized by Colombia as Nicaraguan territory. At the same time Nicaragua recognizes Colombia's title to the islands further out to sea, notably the San Andres group and Santa Catalina.

A third group of islands and keys lying to the north of the last named, and including Quita Sueño, Serrana and Roncador keys, are specifically excluded from the agreement, as title to these is in dispute between Colombia and the United States. A compromise has been made whereby the United States is granted the right to maintain lighthouses and to safeguard navigation, whereas Colombia maintains the fishing rights. This appears to be satisfactory to the State Department and presumably to other branches of the Government.

While there is nothing new or startling in this settlement, it is of interest in the bearing which it has on clearing the way for construction of the Nicaragua Canal. The islands are, of course, merely incidental in the potential defense of the canal route. As Admiral Mahan pointed out years ago, Jamaica is the key to the Caribbean, as it flanks the principal approaches from the north and east. It is true that the American naval base in Cuba and American control of Porto Rico and the Virgin Islands place the three principal entrances of the Caribbean, the Windward Passage, the Mona Passage and the Yucatan Straits, under American control. But Jamaica is nearer the center, and so dominates all.

The principal value of the islands off the Nicaraguan coast which have been the subject of the recent negotiations is in connection with the protection of commerce. If ever the Nicaragua Canal is built, one of the principal shipping lines from the United States will run directly past the westernmost of these islands. It is only natural, therefore, that the United States is interested in seeing that these waters will be properly safeguarded with lighthouses and other aids to navigation.

The Pierce Sextant Camera

Marine Journal, September 15.—What do you think of this? Commander Byrd has taken with him on his antarctic expedition a new kind of camera that will record in a small, snapshot picture, its own position on the earth's surface. This remarkable device, which was perfected, it is said, for the United States Navy, has been lent for the use of the expedition and is based upon an idea of Commander M. R. Pierce, attached to the Naval Air Station at Lakehurst, New Jersey, who worked in collaboration with the Eastman Kodak Company in perfecting and building the instrument, which is known as the Pierce Sextant Camera. Operation of the camera requires only the taking of a picture of the sun, and recording the day of the month. Automatically, the camera supplies, from instruments fixed in its own interior and lighted by four small electric bulbs, the remaining data in picture form, from which may be computed the position, whether on shipboard, aground, or aloft in a plane. What will all the nautical schools do now?

ITALY, JAPAN

Naval Notes

Le Yacht, August 25.—The flotilla leader *Nicolo-Zeno* was launched on August 12 at Fiume. It forms part of a series of twelve ships, laid in 1927, which are of the *Leone* type perfected in point of speed (50,000 h.p. and thirty-eight knots instead of 42,000 and thirty-four), but having only six guns of 120 mm. (five inches) instead of eight.

The two 10,000-ton cruisers now being built will be called *Zara* and *Fiume.* Four destroyers in construction will bear the names of *Dardo, Strale, Breccio,* and *Saetta.*

It is understood that a light cruiser with 100,000 h.p. has been ordered at Trieste.

The 10,000-ton cruiser *Nachi* has been equipped for trials. It is one of the most advanced of the series of which three others, the *Myoko, Haguro,* and *Ashigara* are already afloat, and the last four, the *Takao,*

Atago, Maya, and *Chokaï,* are still in the drydocks.

The destroyers *Nos. 40, 41, 42,* and *43* entered service in July and August. They have a displacement of 1,700 tons and are said to have attained a speed of thirty-eight knots.

MERCHANT MARINE

Present Status of American Merchant Marine

The Nautical Gazette of September 1.—Since the problem of the American merchant marine has taken on new life with the passage of the recent Jones-White Bill, and public attention has been drawn to it, it has been interesting to follow expressions on the subject appearing in house organs of banks, industrial organizations of various natures, and in the daily newspapers, and not a little startling to note the lack of real knowledge of the economic situation involved in the merchant marine problem—these expressions, of course, coming from those beyond the pale of the shipping trade.

The impression seems prevalent that the large fleet of vessels constructed by this country during the war, under stress of a most unusual economic demand, can, with a mere gesture of patriotism, today be turned on to the seas and operate as efficient members of a high-class American merchant marine.

It is refreshing, therefore, to note a report, pertaining to the present status of the merchant marine of this country and its shipbuilding activities, in the weekly trade letter of Dominick and Dominick, one of the leading financial houses on Broadway. In this the conditions under which the Jones-White Bill must operate are set forth concisely and accurately, as are the actual facts which make up our maritime history since the war. We reprint certain pertinent paragraphs in this article, feeling that, though it was written for the general business world, its character is such that it will be both interesting and enlightening to those within the bounds of the shipping industry.

In an introductory paragraph it is stated that about one hundred years ago this country apparently began to lose its interest in the sea, and the American merchant fleet steadily dwindled, until today, despite the stimulus of the World War, it is comparatively negligible. American goods are now transported almost entirely in foreign vessels. Whether the favorable legislation passed by the last Congress on behalf of shipping will have any effect on the re-creation of an American merchant fleet still remains to be seen.

The report summarizes actual tonnage facts in the following presentation:

On the basis of total tonnage, which is by no means an indication of an efficient marine, the United States today ranks second to Great Britain and Ireland. The latest edition of *Lloyd's Register* gives a total tonnage of steel and iron steam and motorships amounting to 61,600,000 tons for the world as a whole. Of this Great Britain and Ireland own 19,700,000 tons, or 29.8 per cent of the total, while the United States owns 10,900,000 tons, or 18 per cent of the total.

Unfortunately, however, at least half of this United States tonnage is obsolete as far as competitive purposes are concerned. Indeed, it is probable that only 4,000,000 tons of United States vessels are capable of competitive operation. This is principally due to the fact that many of the vessels were built a long time ago and that many were hastily built during the war to meet an emergency demand. Of the United States seagoing vessels, less than 3 per cent were launched later than 1923, as compared with 22.7 per cent for the tonnage owned in Great Britain and Ireland. Over 46 per cent of the world's total new tonnage, that is, tonnage under five years of age, is British owned.

The depression in the world shipbuilding industry is correctly placed by the writer on an oversupply of tonnage, but he fails to emphasize that this tonnage is of an inferior quality because it was the result of a war-time demand necessitating immediate production, and that it does not answer the need of a normal condition existing today. Also true is the fact that shipbuilding countries, the United States in particular, have failed to pursue an adequate program of scrapping. There are too many poor ships and too few good ones.

The United States has been particularly laggard in the improvement of its merchant marine. This country has, of course, been handicapped by higher seaman's wages and by the higher cost of shipbuilding, which have made competition difficult.

Its freight vessels are not of modern type. In passenger service there is only one really fast steamship flying the American flag, while England, Germany and France all have many fast passenger vessels, and Germany has recently launched the first of two ships of exceptional size and speed which will operate in passenger traffic next spring.

Currently, the American shipyards are building only about two per cent of the total world tonnage. In other words, however high may be the position of the United States in the total of all

tonnage owned, in modern shipbuilding this country is far behind, having dropped to tenth place among the shipping nations. The first real indication of any improvement in this condition was seen this year when the Merchant Marine Act of 1928 (the Jones-White Shipping Bill) gave new encouragement to American shipbuilding interests.

The article points out the principal provisions of the Jones-White act, insofar as they may tend to eliminate the handicaps to American shipping, and ends with the usual lament that for a nation which has the largest foreign trade in the world, amounting to the enormous sum of around nine billion dollars a year, eighty-eight per cent of which is carried in vessels bearing the flags of other nations, the construction of a fast merchant marine should be a logical step in commercial progress.

While this article does not intend to present any tangible solution to the problem, it at least (and this is our reason for reprinting portions of it) sets forth accurate and intelligent information for the consideration of the American public.

American Export Trade

The Nautical Gazette, September 22.—If American shippers need any further encouragement or reassurance that the future of the shipping trade of this country looms bright ahead it can be found in the fact that reports show American exporters did more business in the first six months of the year 1928 than in any twelve months' period prior to the World War. Exports for the first half of the year amounted to $2,377,533,000 or $11,000,000 in excess of the same period a year ago.

The Foreign Commerce Department of the Chamber of Commerce of the United States has recently issued its bulletin, *Our World Trade for January-June,* in which it is pointed out that the growth of American export business as compared with the period before the war has been in volume as well as in dollar value. Heavy gains in tonnage in most lines give convincing evidence that American foreign trade expansion is not to be accounted for solely by high prices.

It is significant that during the first six months of 1928 out of 141 principal commodities in our export trade 92 were shipped abroad in larger volume than in the corresponding period a year ago. These increases range from 1.7 per cent for wheat flour to 205.9 per cent for borax. Most of the increases were in exports of American manufactured products, which are gradually becoming a more important factor in our export trade.

Manufactured products scored the heaviest percentages in the export trade of the United States. Completely finished manufactures constituted 47.2 per cent of the value of our exports, semi-finished manufactures 15.9 per cent and manufactured foodstuffs 9.6 per cent. This is a total for manufactured products of 72.7 per cent of our domestic exports.

It is also interesting to know that twenty-seven of our twenty-nine chief exports whose total values were higher than a year ago were manufactured merchandise.

This élite class comprised automobiles, accessories, and parts; agricultural machinery and implements; electrical machinery and apparatus; construction and conveying machinery; power-driven metal-working machinery; typewriters, accounting, adding, and calculating machines; hand tools, refined copper bars and ingots; structural iron and steel; lubricating oil, kerosene, paraffin wax; industrial chemicals, paints, pigments, and varnishes; medicinal and pharmaceutical preparations; boards, planks, and scantlings, sawed timber; books, maps, pictures, and other printed matter; photographic goods; cotton cloth, duck, and tire fabric, cotton yarn; leather; undressed and dressed furs; cigarettes; lard; condensed, evaporated, and dried milk; and canned fruit.

Eight of the twelve big industrial groups fared well in our export trade. Exports of vehicles increased 17.2 per cent in value; machinery shipments gained 13.1 per cent; metals were up 4.6 per cent; the value of exports of paper manufactures increased 10.2 per cent; lumber and kindred products gained 3.6 per cent; inedible animal products, such as leather and furs, were up 20.6 per cent; chemical products increased one per cent; and textiles as a whole .2 per cent.

The leader of American manufactures was made up of automobiles, parts and accessories, which continued an upward climb with exports amounting to more than one-tenth of our total shipments abroad. During the first half of this year we exported 194,000 passenger cars, 58,957 motor trucks and busses, 76,932 automobile engines, and 1,249,000 tires—high marks for the auto-

motive industry. The upward trend of our exports of agricultural machinery and implements has been one of the brightest spots in American foreign trade, the value for the first half of the year reaching $54,012,000. We shipped abroad during this period 2,082 combines, 13,944 grain harvesters and binders, 130,000 horse and power plows, 1,763 threshers, 28,061 wheel tractors, and 1,237 track-laying tractors.

Among our ten leading exports cotton and leaf tobacco were the only items to show declines in both value and quantity. Exports of gasoline, totaling more than one billion gallons, exceeded all previous six months' figures in volume, although the value of $104,421,000 was twelve per cent below the 1927 figure.

The most striking increases in value of exports were shown in corn, with an increase of 94.6 per cent, and furs, 65.3 per cent; while the severest declines included wheat, 51.3 per cent, and rosin, 54.8 per cent.

Outstanding gains in export volume were borax, with an increase of 205.9 per cent, iron and steel scrap, 139.6 per cent, logs and hewn timber 138.1 per cent, combines 107.8 per cent, and threshers 162.4 per cent.

ENGINEERING AND RADIO

Two New Engines

Washington *Post,* September 25.—Following the Packard Motor Company's development of a practical Diesel airplane motor comes the demonstration in Texas of a cycle internal combustion engine that has no valves or carburetor and has only thirteen working parts. Announcement is also made from London, through the Department of Commerce, that the Royal Automobile Club has tested and found practicable an automobile engine burning crude oil. The Packard motor has been in the stage of experiment for years, the chief stumbling block to the development of a practicable Diesel airplane engine having been weight. The new engine weighs but three pounds per horsepower, and may prove to be as adaptable to automobiles as it promises to be to airplanes.

The motor demonstrated in Texas develops between eighty and ninety horsepower in the 4-cylinder model, and 200 horsepower in the 8-cylinder model. The former weighs 175 pounds. The latter, with its twenty-one working parts, weighs 250 pounds, and with both motors it is said that refinements possible with machine production should cut the weight about sixty pounds. The motor is air cooled, functions equally well in an upright or inverted position, and requires no carburetor, valves and attendant parts such as rocker arms, camshaft, or tappets.

The British oil-burning motor also operates without a carburetor, and makes use of a fuel that costs only five or six cents a gallon. With a twenty-ton load, a truck powered with it is said to have made a trial run of fifty miles at an average speed of about eight miles an hour, with a reduction in over-all ton-mile cost of approximately one-third as compared with the ordinary gasoline driven truck.

Time alone will tell whether or not these three motors are destined to play an important part in the field of transportation. Each promises much, particularly the Packard engine, which is based on theory and design that already has proved its efficiency in commercial operation. The Texas and British developments are more radically new, but if they prove their efficiency in further tests the automotive and aëronautical industries will be forced to adopt them, even though their adoption would mean the junking of processes and theories now considered fundamental.

Navy to Record Static at Sea and on Shore

Washington *Post,* September 16.—The United States Navy is to record static. An automatic static recording device similar to radio storm detectors now being installed at five shore stations will be placed aboard the Navy aircraft carrier *Lexington* or *Saratoga* within the next six months. Stations which also will have storm detectors are Anacostia, D.C.; Lakehurst, New Jersey; Coco Solo, Canal Zone; Pensacola, Florida; and Hampton Roads, Virginia.

The foregoing decision is based on result of establishment of definite relationship between static and storms, weather disturbances being frequently preceded by heavy static and difficulty in radio communication. The recording of static disturbances by the device will aid in weather forecasting and be of value when vessels are without range of radio storm signals.

The plan as outlined by Lieutenant F. W.

Reichelderfer, Bureau of Aëronautics, follows:

"The use of static observations to determine the existence and location of storms obviously can be successful in every case only if all storms are the source of static impulses, which can be intercepted by radio receiver and the hearing of the source determined by the radio compass. Unfortunately for the weather forecaster, observations have shown that some storms appear to be accompanied by little, if any, static disturbance.

"Still others, which are accompanied by static, are difficult to locate because the static from them appears to come from no definite direction. On the other hand, hundreds of successful cases could be mentioned. The reasons for these differences are not clearly understood at present.

"The type of static generally ascribed to thunderstorms is that known as 'crashes.' Distinct 'crashes' seem to be the most typical of ordinary lightning flashes, but occasionally only 'clicks' are heard from a very close flash, perhaps as a result of paralysis of the radio tubes. Some observers have apparently identified the type of static known as 'grinders' with far-distant thunderstorms. It is not known whether 'grinders' are produced by ordinary visible flashes when they occur with great frequency in a region far distant from the receiving station, or whether they are the result of more or less continuous invisible discharges which are supposed to occur.

"'Grinders' constitute the type of static interference most troublesome to radio communication. While most investigators have found that weather conditions of one type or another are responsible for 'grinders,' some have advanced the theory that this type of static is largely the result of electrical disturbances in the upper atmosphere more or less independent of weather conditions, and still others have ascribed it to frictional effects at the boundaries of winds of different velocity and temperature.

"Investigations which have been under way for several years may yield knowledge of more definite relations between static and weather. These investigations have already led to the establishment of the well equipped static observation stations, which will aid in the location of severe storms at sea before they have been reported by regular vessel weather observers. In view of the number of instances already reported where static obstructions have been used successfully as an aid in determining the location of a storm, the navigator is justified in accepting static as an added indication of the presence and position of a storm, even though it cannot be accepted as an infallible indication at the present time."

AVIATION

New Boeing Single-Seater Fighter

U. S. Air Services, September.—The Flight Test Section of the Naval Air Station at Anacostia, D.C., is nearing completion of rigid service tests on a most interesting single-seater fighter turned over to the Navy for adoption. This new proposition, built by the Boeing Airplane Company, of Seattle, Washington, has been the center of sustained interest on the part of Army, Navy, Marine, and civilian airmen in Washington and those from the outside who have dropped in. The little ship represents the latest step taken in this country in pursuit craft and was turned out by the Boeing Company as its own property and submitted to the Navy. Its manufacturer's demonstration test, given by Leslie Towers, chief test pilot of the Boeing factory, was most impressive.

However, Lieutenant S. W. Callaway and his colleagues in the flight test section turn blind eyes and deaf ears to exclamations of the onlookers and see only one goal for the ship: "Will it meet service requirements?" Since receiving the little plane for test the naval pilots have put it through the paces, and, as *U. S. Air Services* goes to press, are nearing completion of their task. Obviously the results of their findings will not be made public.

Powered with a Pratt and Whitney Wasp Series B engine, whose rotor has been stepped up from 5-1 to 10-1, the little fighter has clipped off more than 180 miles an hour on the straightaway, according to reports received from Seattle when it made its maiden flight. The ship is 500 pounds lighter than the standard *F2B-1* now used on the carriers and can carry a load of 800 pounds. When this load is pared down it also can carry a 500-pound bomb.

The Boeing fighter was given its manufacturer's performance test before Admiral

Moffett, Chief of the Bureau of Aëronautics; Captain H. C. Richardson, Chief of the Design Section of the Bureau, and numerous other officers from that establishment; Lieutenant Commander D. C. Watson, commanding the Naval Air Station, and officers of the flight test section.

Towers gave the little plane a terrific beating for one-half hour, twisting, turning, looping, rolling, spinning, and diving through the sky with the engine full out. Throughout the performance, all interest centered about the ship as though it were flying without a pilot, so convincingly did Towers emphasize the craft's ability. In a stock model pursuit plane such evolutions would deal entirely with the pilot.

Towers gave two outstanding features in his demonstration: One, a dive with the engine wide open, for 4,000 feet, which set up an air speed of more than 300 miles an hour; the other when he spun the ship, making fourteen turns. He also showed the remarkably quick take off, the controllability at minimum flying speed, the ease with which it could taxi around the ground, and the slow landing speed.

The Boeing Company is to be congratulated on this product as it appears from the side-lines; also for its interest and foresight in endeavoring to keep the United States in the lead in this vital element of military aviation.

Evaporative System for Cooling Engines

London *Times*, September 12.—Wing-Commander T. R. Cave-Brown-Cave, who read a paper in the Engineering Section yesterday on "The Evaporative Cooling of Aëro Engines," said that the tornado engine to be installed in airship *R-101* would be arranged with a system of cooling in which, while water was circulated through the engine, it was only steam and hot water that passed from the engine carrying the waste heat to the radiators discharging it to the passing air. The system was being developed for use in airplanes also.

In this evaporative system the waste heat was carried away as the latent heat of a comparatively small weight of steam at approximately atmospheric pressure, so that less strength and less careful precautions for water-tightness were necessary than in a water system. Also the most effective parts of the outer cover of an airship could be used for the dissipation, and the dissipating surfaces could take a form which would be quite impossible if liquid water were the vehicle.

The dissipated heat could be applied to warming the passenger quarters of an airship, and possibly it would later be used also for warming the pilot and passengers of an airplane. An experimental unit at the Royal Airship Works has been reproduced with minor alterations in the power unit intended for *R 101*. Water was delivered by the circulating pump to the casting which contained all the cylinder liners. It then passed through all the cylinder heads in parallel to a manifold, which led the water and steam to a column in which a baffle guided the water down to the pump while allowing the steam to pass away to the pipe leading to the radiator or the condensing ducts. The water was returned to the bottom or separator column near the pump suction.

The intense vibration of the surfaces of the engine was found to assist in the liberation of steam, and the temperature of the hottest points in the cylinder head was actually reduced when the formation of steam began. This apparent paradox was probably due to the fact that bubbles of steam, unlike water, could move away at right angles to the surface.

Experiments in "Blind" Flying and Landing

New York *Times*, September 30.—The problem of flying through fog is believed to be nearing its solution. Better instruments for keeping the plane on a level keel, radio direction beams, and other devices have made it possible for skilled pilots to fly "blind" through dense fog. But the great problem of fog flying is to land the plane when there is a blinding white blanket over the earth and nothing can be seen of the hills or trees or obstructions around an airport.

It is toward the solution of this difficulty that the efforts of the Guggenheim Foundation will be directed. Every possible instrument that can be used will be tested, and it is hoped that with the increasing interest on the part of scientific men in aviation a way will be found to get a plane safely to earth through the densest fog. A plane will be fitted up as a flying laboratory and actual tests made under progressively difficult con-

ditions until the value of the various instruments available has been shown.

When a plane has been selected it will be used over some part of an air route on which fog is a continual danger, probably over the Alleghenies or on the Southern route along the Atlantic coast. The tests will necessitate the most dangerous kind of flying but the work must be done if aviation is to progress.

There have been a number of attempts to solve the problem of landing in fog, many of which have been carried out in England. At Croydon fog frequently ties up all flying operations. Experiments have been made there with radio and with signals from a leader cable around a field which indicate when a plane has reached the outer fringe of a landing field from which a normal glide would be begun. But so far they have not been satisfactory, and the experiments both abroad and in this country have been uncoördinated. The Guggenheim Foundation will bring together all the appliances which may be used. It is the only private organization in the world with sufficient funds to undertake such research work and keep it going.

There are a number of new devices which will be tried out very soon, particularly the capacity altimeter and the sonic altimeter. Both these instruments give the actual distance above the ground instead of the distance above sea level. Dr. William D. Coolidge of the General Electric research laboratory, has been working on some of the problems involved, and instruments devised by him will be among those tested.

The plane to be used will have double control, and the instruments will be tested first in good weather so that their action may be observed under safe conditions. Then one plot will be closed in so that he cannot see the ground or the horizon, and the instruments for locating the field and landing will be tested with the second pilot ready to take over the controls in an emergency. After the value of the instruments has been proved and safe landings have been made with additional precautions, attempts will be made to land the plane in fog with only the instruments or signals from the ground as guides.

Navy Building All-Metal Dirigible

New York *Times*, September 30.—An experiment in the construction of lighter-than-air ships, now being carried out in the great hangar of the Aircraft Development Corporation at Grosse Ile, Michigan, just outside of Detroit, is attracting much attention among aëronautical engineers all over the world. The engineers of this company are building an all-metal dirigible for the United States Navy, and latest advices from Detroit indicate that the ship will be ready for its maiden flight in February.

Another experiment, similar in that an airship is being built entirely of metal, including the outer covering of the bag, is being conducted at Los Angeles.

Built of duralumin, the ship now nearing completion near Detroit, if successful, is likely to revolutionize the construction of lighter-than-air craft not only in America but abroad. First of all its designers claim a speed per horsepower and efficiency for the new ship far superior to that of the present-day Zeppelins and dirigibles. The ship is to be powered with two Wright Whirlwind engines, giving it 400 horsepower. It is designed for a speed of seventy miles an hour. Another and larger ship, not yet under construction, has been designed by the engineers of the same company. Its specifications are for a speed of 100 miles an hour, which, if attained, would make it as fast as many airplanes.

The all-metal airship now nearing completion is being built as a part of the Navy's five-year program, and $300,000 has been appropriated toward the cost of its construction. The Aircraft Development Company, however, has raised a probably equal amount among Detroit business men and this is being spent on the ship in addition to the Navy appropriation.

The new ship is 150 feet long and has a height or diameter in its thickest section of more than 50 feet. It is a short, chunky affair, being in shape more like an egg than a cigar, which some of the more conventional rigid types resemble in line. The duralumin covering is laid on in sheets, each sheet being long enough for a complete belt of the hull. In this connection the designers have invented a riveting or metal-stitching machine, which is likely to be of importance in airplane and even boat building. The machine places 40,000 rivets in eight

hours, literally sewing the metal covering on the hull and doing a gas-tight job of it.

The thin duralumin covering is supported by internal beams designed to hold the ship in its normal shape against all normal pressures. The lifting gas is not carried in the ordinary fabric balloonets but in the metal hull itself. Allowance for expansion and contraction of the lifting gas is made by means of a fabric air bag or balloonet on the bottom of the hull, which will contain an inlet valve or air scoop facing forward and an outlet valve opening just to the rear of the control and passenger car beneath the hull.

Among the advantages claimed for this new type of dirigible is longevity without replacements. The ordinary fabric covering, even though painted with the best protective covering against the sun, lets in enough of the sun's rays, it is said, to shorten the life of the gas containers considerably. Protection against sleet and ice, which critics say will form more quickly on the metal covering than it does on the ordinary "doped" fabric, is being provided by a heating arrangement whereby gases from the motors can be shunted into the hull and against the inside of the covering.

"Autogyro" Flies from London to Paris

Baltimore *Sun*, Sept. 18.—A virtually vertical landing at the airport here today brought to a close the longest trip ever performed in one day by an autogyro or "near helicopter" flying machine.

The machine, which carries four huge blades rotating horizontally on its top, in addition to the regular propeller of an ordinary plane on its nose, averaged 100 miles an hour while it was in the air. It made three landings en route, at Lympne, Kent, England; St. Inglevert, near Cape Griz-Nez, and at Abbeville. The Abbeville stop was not on the program, but Senor Cierva denied that anything had gone wrong with his machine.

When the machine landed here it came to a full stop on the ground only 200 feet from the perpendicular point where gas was cut off in the air. This is about one-tenth of the distance traveled by regular airplanes after landing. The machine was only 150 feet in the air when it began its descent.

New Plane Designed To Eliminate Stalling

Baltimore *Sun*, Sept. 13.—A new airplane that differs radically from previous models, that completely eliminates the possibility of stalling—the constant fear of the pilot of the ordinary plane—and that is as easy to control as an automobile, is one of the first products of the newly organized Daniel Guggenheim School of Aëronautics at the California Institute of Technology here. It was demonstrated at the air meet at Los Angles, and proved a sensation.

The new plane was the original idea of Albert A. Merrill, who is not a professional airplane builder, although he has been connected with experiment aëronautics since his original association with Octave Chanute in 1891. Though he was told long ago that his idea was worthless, he persevered for more than fifteen years, finally to prove its validity.

What strikes one who sees the plane for the first time is its short stubby tail, which extends only for about four feet back of the rear cockpit. There is no stabilizer, though there is a large vertical rudder. The wings are staggered; that is, the front of the lower wing is under the middle of the top one. There is a four-degree positive decalage, as the aëronautic engineer calls it. This simply means that if the lower wing is horizontal, the upper one slants forward and upward at an angle of four degrees.

But most novel about the wings is the fact that they are not rigidly fastened to the fuselage. The two wings are fastened rigidly together and pivoted to the fuselage about the rear span of the upper wing. The result of this design is that the wings are stable in themselves and not dependent upon the tail surfaces, as in the ordinary plane.

The angle of the wings with the fuselage is controlled by a crank handle by the pilot's side, connected to the wings by a sprocket and chain. This takes the place of the elevator of the ordinary plane. When the pilot wishes to ascend he merely sets the wings at an angle and forgets about them until he is high enough, then he sets them level and continues horizontally. If the engine stops or if the pilot deliberately shuts off the power, the ship glides down along a slant line, but is always horizontal. Under such circumstances the ordinary plane might stall

and go into a tailspin, probably with disastrous results.

Associated with Mr. Merrill in the building of the plane was Dr. A. L. Klein, who did most of the fitting design, and Dr. Clark Millikan, who was responsible for the aërodynamic and primary structure design.

"The ordinary airplane is like an automobile that couldn't be steered if it was running slowly," said Dr. Millikan, today to Science Service. "With the Merrill plane, however, longitudinal, or up-and-down, control is possible even at the slowest speeds. The control of the angle of attack, which is the angle at which the wings meet the wind, is independent of the air speed. A sudden gust of air, which would throw the ordinary plane out of line, merely lifts the entire plane without disturbing its horizontal position. The pilot only has to control his movement in two directions—to one side or the other—instead of in three.

"The Merrill design also permits landing in a much shorter space than ordinarily."

MISCELLANEOUS

Air Coöperation with the Fleet

Lieutenant Commander A. W. Clarke, Royal Navy.

In the *Journal of the Royal United Service Institution*, Aug. '28.—In discussions on the employment and value of the air arm at sea two extreme points of view often emerge. The optimist, impressed by the results of peace-time exercises and experiments, contends that aircraft have revolutionized strategy and tactics, replaced in fighting value many classes of surface warships, and entirely altered the complexion of sea warfare. He draws alarming pictures of the naval action of the future, and complains bitterly of conservatism and lack of interest in the new arm. In fact, he is very much akin to the submarine enthusiasts in the days when they were wont to prophesy the speedy obsolesence of the surface battleship.

The pessimist, on the other hand, deplores the waste of time and money on what he terms a fair-weather weapon. He draws attention to the enormous cost of highly vulnerable carriers, and to the low range of visibility and short radius of action of aircraft. He suggests that aircraft are being pressed forward at the expense of what would be wiser investments in surface craft.

It seems possible to find a happy mean between these two extremes. It is certain that aircraft have found their place in sea warfare, but as to how far they will influence naval activities it is more difficult to say. The last war did not provide any actual experience worth mentioning of aircraft coöperation in a fleet action. Ship-borne aircraft were employed on but few occasions: an attack on an airship; a few raids on shore stations; and a certain amount of reconnaissance. In fact the late war did not materially assist to solve the problem of how far the results of peace exercises today are likely to be modified under the conditions of a future war.

The extreme optimist contends that fighting aircraft will take the place of warships and that the command of sea communications will rest with the side that puts most aircraft into the air. He appears to lose sight of the fact that, for the present, the bulk of overseas trade must continue to be carried on surface ships. These ships remain at sea for long periods; they can travel by night; furthermore, they can be provided with a certain amount of protection in the shape of guns and surface escorts to guard them against bombing and machine gun attack from the air, in much the same way as protection was afforded them against underwater attack in the late war.

Let us argue some more of his points. It is agreed that enclosed waters and focal points will provide great opportunities for aircraft, but such areas are also apparent to the threatened party which will, in all probability, be equally capable of providing air defence. On the open trade routes, it is very doubtful whether aircraft can menace shipping to the same extent as the surface raider; they certainly cannot protect it as efficiently as cruisers or auxiliary warships. As long as the necessity for these latter remains, so long must there be a battlefleet to support and protect them from more powerful enemy warships. Ultimately, the safety of communications may be decided by a fleet action, when the successful side will be left free to concentrate on the security of their trade and the destruction of that of the enemy.

It is, however, a short-sighted critic who refuses to take aircraft attack on merchant shipping seriously and, in particular, quotes

the inconclusive effects of bombing attacks in the past. It is well known that the offensive powers of aircraft have increased immensely; today, attacks on ill defended shipping centers and congested areas would, undoubtedly, inflict damage, serious both to material and, in its effect, on public *morale*. Yet this is the very situation that was met, and countered, in the channel and approaches to British ports in the last war when the submarine was the great menace in these areas. The intensive submarine campaign was defeated by patrols, convoy organization, and dark hour sailings. The same organization, with the important addition of the counter-offensive air patrol, should still meet the case.

The air needs of the Navy can be divided into those which will be met by ship-borne aircraft with the fleet and those which will require coöperation by seaplanes and flying boats working from shore bases. In comparatively enclosed waters such as the North Sea and the Mediterranean, air patrols maintained from the shore stations of countries bordering those seas must have their influence on the strategy of fleets. This influence was felt in the last war to a certain extent, but permanent patrols had not been developed to any degree before hostilities ceased.

The great expansion that is foreshadowed, and that has as a fact arrived in air fighting forces, is likely to complicate, rather than to stultify, the activities of a fleet. Evasion and deception may often have to be practised by day while the real movements are made during the dark hours; but the cardinal problem of bringing an unwilling enemy to action still remains. The advent of aircraft has brought its solution no nearer, indeed they may often assist him to avoid a meeting.

The optimist visualizes the maintenance of a continuous air patrol observing a hostile fleet during the whole time it is at sea. This is indeed optimism. To begin with, the fleet will have more than sufficient machines available to drive off the number of aircraft which could be maintained in the air at any appreciable distance from their base. It is admitted that it is beyond the capacity of the aircraft carriers with the fleet to maintain sufficient air patrols to preclude *any* contact by enemy aircraft; but such contact would, at best, be intermittent. The fleet, it must be remembered, carries its air base with it, while the shore base has to cater for the time elapsing between the departure of a patrol aircraft and its arrival on the beat plus the time it will take to return. The further the patrol area from the base the shorter the endurance time on the patrol, and hence the greater the number of machines required for any one permanent patrol.

Nevertheless future wars will, unquestionably, see the establishment of more or less permanent coastal air patrols, and the depth of such patrols will depend on the endurance and number of the craft employed. Operations, such as coastal raids by enemy surface craft, will in consequence be more difficult, and episodes like the escape of the *Goeben* will be less frequent.

Limitations of the Flying Boat

The extreme optimist and the extreme pessimist are often in agreement on one point, that is the uselessness of aircraft carriers; but they see the matter from different angles. The one contends that the flying boat can and should replace the expensive carrier, while the other regards the carrier as a mere encumbrance to the tactics of the fleet and anticipates that it will probably be out of action by the time the battle lines are engaged.

The flying boat's capacity for accompanying the fleet must not be gauged in terms of radius of action, but in that of hours of endurance. The existing flying boat's radius of action is about one-sixth that of surface units of the fleet at war speed, while her endurance is only about one-tenth. Therefore, even if it is assumed that the rival fleets will meet within the radius of action of the flying boat from her base, it would still be necessary to refuel every aircraft at least twice in each twenty-four hours if it is to remain in company with the fleet and be ready for immediate action.

Where the fleet is at sea with the likelihood of a meeting with the enemy without much warning, the aircraft required in battle must be ready for operation at any moment. A fleet of flying boats carrying torpedoes and reconnaissance and spotting personnel would require considerable organization in the form of special refuelling craft and the like, to keep it ready for immediate work. Such auxiliaries would be as vulnerable as

aircraft carriers, and their protection would give rise to similar problems. There are, also weather conditions to be taken into account.

If the flying boats are to remain at their base and only provide reconnaissance in a series of reliefs while the fleet is at sea, the area of fleet operations becomes restricted to one well below the radius of action of the flying boat. Even so there would be considerable delay before the full force of fleet aircraft could arrive, and, during the interval, the enemy, operating from carriers, let us suppose, would hold the mastery of the air. The synchronization of attacks would also prove still more difficult.

Flying boats can undoubtedly be of assistance to a fleet, but carrier-borne aircraft must be provided if the fleet is to be assured of having aircraft ready for immediate action.

The Best Type of Aircraft Carrier

The pessimist's contentions as to aircraft carriers must be admitted to a certain extent. The movements of a carrier while operating aircraft are governed by the direction and force of the wind and the demands made upon her as to aircraft.[1] Moreover both fleets will make efforts to sink the opposing carriers, and both sides will endeavor to obtain a position of advantage relative to the wind. At the same time the carrier has a high turn of speed and is capable of maintaining a safe distance from the enemy's main forces; but this may be at the expense of her aircraft value. In other words, the outmaneuvred side must resign itself to a curtailed supply of machines, even though this does not necessarily mean the actual loss of any carriers.

With unlimited building the solution would be simple. A fleet could then possess sufficient carriers to station them so that whatever the direction of approach of the enemy a reasonable number would be free to fly off their aircraft. In other words the fleet would be provided with a reserve of carriers above the normal requirements for action. This is a most unlikely event, and the problem becomes one of how best to invest the money available for carriers.

At first sight a number of small carriers seems preferable to a few large vessels. The loss of one carrier then becomes of relatively smaller importance and here is less chance of the majority of the fleet aircraft being placed in such a position that they could only be operated with danger to the carrier. On the other hand, the smaller carrier cannot mount the same protective armament, and she is at once more vulnerable to attack from light craft. She is more susceptible to the weather and will not provide as steady a landing platform as the bigger ship. On the side of expense the cost of two small carriers would be considerably greater than that of one twice the tonnage.

There are, however, limits to the usefulness of the large carrier. The most important is that, although the size of the carrier can be increased more or less indefinitely, the number of aircraft that can be operated from it does not increase proportionately. The number of carrier-borne aircraft that can be operated is not limited solely by her size; it is limited also by the efficiency of the carrier in respect to the time during which the flying decks are occupied with launching or landing aircraft. As an example, two 11,000-ton carriers could each be designed to carry fifteen machines; while a 22,000-ton carrier might be designed for thirty-four machines. Under certain conditions of weather the two smaller carriers will, together, be able to operate thirty machines, while the large carrier will be unable to operate a similar number due to deck limitations. It is apparent that with designs on existing lines a carrier can be built to carry any number of machines; but, beyond a certain average figure, additional machines will only exist as replacements to casualties. A carrier carrying, say, seventy machines will never be able to place them in the air together with any hope of recovering them again. The large carrier, however, is of value as a transport of assembled or partially assembled aircraft for subsequent operation from a shore base.

As far as sea work is concerned it looks as if a sufficient number of *Hermes* type of carriers would provide a more certain service of aircraft. If expense precludes this, then a compromise in the shape of a lesser number of medium sized carriers, such as *Furious* or *Eagle*, sufficiently large

[1] See "Aircraft Carriers in a Fleet Action" by the same author—*R.U.S.I. Journal*, August, 1926, p. 521.

to carry the full number of aircraft that can normally be operated and with a small reserve for action replacement, offers the best alternative. The construction of monsters such as the U.S.S. *Saratoga* with a reputed capacity for seventy to eighty machines is putting too much reliance on the safety of the carrier, and neglecting sound consideration of the proportion of the aircraft carried that can be expected to play any part in action.

The medium-sized carrier can be sufficiently armed to keep light craft at a respectful distance, and for further defence her tactics must be such as to place her within cover of her own battlefleet, should her safety be in jeopardy from enemy concentration. Finally, the decision as to whether the safety of the carrier is of greater importance than the provision of more aircraft must be based on the action situation at the time. It must be realized that this may often necessitate refusing machines already in the air the opportunity of landing on.

Fleet Aircraft

Experience is yet required as to the proportions of the various types of aircraft that should be carried with the fleet. They can be divided under three broad headings; machines suitable for reconnaissance and action observation, torpedo-carrying aircraft, and fighter machines.

Reconnaissance

In reviewing the activities of aircraft in the fleet, reconnaissance must be placed first in order of importance. Early, continuous, and accurate information of enemy movements is of the greatest value to the commander of a fleet. For this work aircraft have the special advantage of possessing a high standard of mobility, while their commanding position makes for accuracy in reporting an enemy's course and formation. A cruiser screen would take ten hours to advance a hundred miles ahead of the fleet where aircraft could take up a similar station in little over an hour. On the other hand the radius of visibility from aircraft is often exaggerated, and there are many occasions when their vision is limited to that obtainable by surface craft. At present, moreover, aircraft cannot attain the same accuracy in position keeping as a surface ship.

The contention that aircraft can replace the cruiser screen is not borne out in practice. Air reconnaissance is of little or no value at night, and aircraft cannot screen the fleet from enemy surface reconnaissance. Both these duties must still be performed by the cruisers of the fleet, but, in suitable weather, the employment of aircraft will permit the cruiser screen to be concentrated before contact with the enemy, whereby the cruisers can move at once, on the aircraft reports, to break up the enemy surface screen. There must still remain many occasions, however, where aircraft reconnaissance could not be carried out; such as in heavy weather, low visibility, and when adverse winds would reduce the carrier's endurance too far for flying on and off reliefs over a long period.

Once the commander-in-chief is in possession of sufficient information regarding the enemy's movements and composition, the battle fleet can be deployed to best advantage. When battle is joined the function of the reconnaissance aircraft becomes what can be termed action observation. There is no question as to its value, for additional channels of information are always an asset, and aircraft will often give better facilities for observation than surface craft.

Observation, by itself, however, is of little value without good communications. An examination of the signal records of a fleet action, such as the Battle of Jutland, demonstrates immediately the quantity of messages that flood the offices of the fleet flagship on such an occasion. The signal department have now to face the imposition of an additional strain in the form of aircraft communications. It must be pointed out that the essential signal links between the aircraft and the directing authority may break down for a multitude of reasons. To this is added the unreliability of positions given by aircraft and the difficulty of identifying casualties in the air. In view of the lack of experience under battle conditions, it seems sound therefore that reliance should not yet be placed in air reconnaissance and observation to the exclusion of the existing surface organizations.

It is hardly necessary to repeat that aircraft will not be left untroubled to pursue their functions. They will be subjected to attack by fighters and anti-aircraft fire at intervals, and the replacement of casualties

may not be possible owing to the carrier's preoccupation. Here again, peace exercises can provide little data.

Generally speaking, air reconnaissance and action observation will be a definite advantage to a fleet provided the weather is suitable; but the extent to which the fleet organization can rely on the same must depend on the amount of attention the enemy pays to offensive fighter tactics against the observation machines.

Torpedo Carriers

Turning now to torpedo plane attack, we are once more faced with a lack of data. The optimist quotes the effect of attacks carried out in exercises against isolated ships and, in particular, against the head of the battle line. The pessimist contends that the fire that would be brought to bear against these aircraft would entirely disorganize any effective attack.

There are, obviously, the best moments for torpedo attacks and continual investigation will prove at what stage of a battle torpedoes fired from aircraft are likely to be most effective.

To achieve success the aircraft must make every effort to reduce the interval during which they are under observation. Opportunities to attack are not difficult to foresee and it is certain that if the aircraft time their moment well the targets will have only a few minutes in which to decide on the method of evasion to be employed. The low range and high speed torpedoes used by aircraft can be dropped sufficiently close to their targets to make nothing less than drastic and immediate avoiding action effective. This is somewhat disconcerting to the proper control of a battle line. If their aircraft attack when the line is already engaged with the enemy, the time available will not be sufficient to bring effective fire to bear on the attacking machines. It would be necessary to shift target and probably reload with a different type of shell. It is difficult to judge what will be the effect of gunfire directed at aircraft in the heat of battle, and the casualties imposed in peace time are, generally speaking, assessed on the calculations of theoretical results.

So far, therefore, the advantages appear to lie on the side of the aircraft; but they will be faced with many difficulties which do not exist in peace practice. Torpedo flights will not be left unmolested. They will be attacked by fighters who will try to break up their formation. There is also the moral effect in action of leaving a carrier, probably under fire at the time, with the knowledge that it is more than a possibility that there will be no carrier to return to on completion of the attack. Although the effect of gunfire defense is as yet a somewhat doubtful quantity it cannot be written off as negligible. Whatever method of air attack is employed, gun blast, cordite smoke, water splashes, and the general disturbance of the air with two battle lines in action must be factors in marring the ideal attack.

Progress has always met each new method of offense with an efficient method of defense, and the optimist who visualizes a broken and sinking battle line at the end of the enemy's aircraft attack is no more reasonable than his predecessors who conjured the same picture out of torpedo boats or submarines. Defensive methods will develop step by step as the offense becomes more intensive. Again, if the extent of the air menace to a fleet is analyzed, it will be found that it is directly proportional to the striking force that can be placed and maintained in the air which again, is strictly limited by the carrier tonnage available on the scene. The continual stream of torpedoes launched from the air, which in theory, are to completely disorganize the battle fleet is not a practical proposition. It requires some fifty torpedo planes in one attack to equal the torpedo menace of a single destroyer flotilla. It is true that the warning of an air attack is considerably shorter, but the necessary drastic action to minimize the results of such an attack can be taken, and, once the attack is passed, the battle fleet will be able to count on a considerable respite before it could be repeated. To produce effective results aircraft must attack in large numbers. This will call for a high standard of organization between carriers to ensure synchronizing the attacks of the various torpedo flights. Once again the factor of communications enters the field.

No commander-in-chief will ignore the necessity for counter offensive to reduce the air menace. The carrier's existence will be hazardous in the extreme. Whatever the defenses provided she will be liable to attack by bombs, torpedoes, or shell fire. Even

though she may avoid actual damage, a carrier may be forced to abandon a prearranged plan and obliged to seek cover under the guns of her own fleet. This would completely disorganize concerted action with her consorts. In fact the only safe deduction to be made from peace exercises is that a high percentage of hits can be obtained by one or more flights of torpedo machines, but only provided that they reach their firing positions successfully.

Fighters

Fighter machines, flown both from units of the fleet and from carriers, can be employed to attack enemy observation and torpedo or bombing aircraft, or to shoot at exposed personnel in surface ships.

The capabilities of the carriers being limited it is necessarp to weigh the merits of providing a greater proportion of fighter machines to other types or vice versa, the total number of machines remaining necessarily more or less constant. The successful side will be the one whose organization is sufficiently flexible to allow a readjustment of the numbers of various types as the situation changes. It may be necessary to maintain a high percentage of fighters in the air in the early stages of an action to cover torpedo attacks and protect observation machines. Later, air supremacy may have been achieved to a large extent and it would be possible to reduce the number of fighters and correspondingly increase the numbers of other types of aircraft in the air.

If there is to be any subdivision of duties among fighters, it would seem that the organized flights from carriers should be employed on aircraft attacks, and that the individual machines flown from units of the fleet, possibly at varying times should be allowed to take free-lance opportunities as they occurred. These aircraft will be handicapped by the problem of finding an unoccupied carrier on the completion of their endurance, or the more unpleasant alternative of landing in the water.

Conclusion

It seems fair to conclude from the foregoing review of fleet aircraft capabilities and limitations that the optimist is over enthusiastic and the pessimist unduly despondent. To sum up, aircraft coöperating with a fleet possessing a flexible organization between carriers, will be a useful weapon in the hands of a commander-in-chief; but allowance must be made for action conditions that cannot be simulated in peace time exercises and which may modify appreciably peace time conclusions.

Aircraft will complicate naval battles considerably. Secrecy of movement at sea is rapidly vanishing and fleets must rely more than ever, for strategical movements, on the dark hours. The new arm makes further demand on light craft for the defense of the battle line and carriers. In these days of small fleets the problem is to draw the line between the lowest number of such craft essential for the defense and the greatest number that can be spared for offensive work.

Very considerable advance must yet be made in self supporting aircraft, such as flying boats, before their endurance as well as their radius of action can approach that of surface ships. Until then they cannot take the place of carrier aircraft. Aircraft carriers in some form must, therefore, accompany the fleet wishing to meet the enemy on equal terms in the air at short notice.

The problem of the carrier's defense is a serious one and may have considerable effect on the tactics of the fleet. The carrier has a high rate of speed, but she is yet very vulnerable as far as her aircraft operating value is concerned, and severely restricted as to her movements by the weather and the operation of machines. The tactical situation is further complicated by the fact that a squadron of carrier will become dispersed very shortly after the commencement of flying duties, even if it has not already been necessary to separate them in the cruising formation.

In the circumstances it would appear that the fullest possible use should be made of aircraft during the early stages of a battle, but that, at all times, the assistance provided by aircraft must be considered in the light of additional aids to the fleet and not as permanent substitutes for duties now performed by surface units.

Let us continue to examine and try out these ideas as exhaustively as peace time exercises permit, and, avoiding a too facile optimism and a too conservative pessimism, regard the future of aircraft at sea with the eye of vision.

The Future of the Battleship: Two French Opinions

COMMANDER C. F. JEPSON, R.N. in the *Journal of the Royal United Service Institute*, Aug. 28.—How does a master mind set about the problem of designing a fleet for the service of his country? What are the factors that limit him? He will be guided by financial necessity, by political considerations and the strategy they demand, and by scientific progress and the consequent evolution of tactics. The problem of balancing these factors is extremely complicated for a first-class naval power even when she has but one rival to consider; for impoverished France, midway between the greater and smaller naval powers, the problem is as bewildering as any that confront the human mind.

It is but natural, therefore, that the two French naval officers whose essays are before us should confine themselves to broad indications of future policy.

Lieutenant Clavery, it is true, strays in spite of himself into the byways of detail and material. To do so is to wander indefinitely into a maze of hypothesis until the author's patience is exhausted and he lifts up abruptly back over hedge and ditch to the main road again.

Lieutenant-Commander Fénard declines to be led away from his main idea, namely that a fleet must consist of a well-balanced assortment of types. Too often, he deplores, has France, encouraged by the inventive genius of her sons, imagined short cuts to naval supremacy, building dreams out of a new type of ship. With what result? Each new hope has proved an illusion, and the French navy has become time and again an experimental laboratory for other and wealthier powers. Fénard presents us with a valuable history of the progress of naval materiel. The steamship, the screw-propeller, explosive shells, steel armor, the monitor, the fast armored cruiser, the torpedo, the submarine, all are reviewed, together with the prognostications of their producers. The history of one is the history of all the others. The enthusiastic inventor outlines his hopes for the future, the blind controversialist proclaims them from the blind controversialist proclaims them from the housetop, the public eagerly believes them. In the background saner minds analyze the new weapon or vehicle on scientific line or from a purely military point of view. But these are unheeded; the politician bows to the popular storm, money is voted, a new type is produced. Within a brief space of time some other power produces the antidote.

This psychological effect of inventions is not confined to France. Popular clamor and parliamentary polemics nearly stopped the building of the British *Nile* and *Trafalgar* in 1886. The torpedo boat was to drive them from the seas. Mr. Hibbert, the parliamentary Secretary of the Admiralty, confessed that he believed no more battleships would be built.

The arguments used a hundred years ago by Paixhans, the producer of explosive shells, employ the very language with which we are familiar today, coming from the blind partisans of the airplane. Equally have these arguments been used by the advocates of the primitive torpedo, of the locomotive torpedo, of the torpedo boat, and of the submarine. What are the claims? Fénard quotes them to the verge of monotony. The new weapon is always to be cheap in both production and manning, and it is always to be invulnerable.

The ordeal of battle is needed to decide the comparative vulnerability of any weapon or vehicle, but a short space of time decides their cost. The initial cost per ton of a destroyer, says Fénard, is now about double that of a battleship, so is her complement of personnel per ton. The maintenance of the *Lorraine* (battleship) costs 315 francs per ton per annum, that of the *Bouclier* (destroyer) 1,460 francs.

Coming to the submarine we find that for every one submarine at sea in 1917, the Germans had two in harbor, resting or repairing. The airplane cannot arrive in contact with enemy ships without the assistance of an aircraft carrier. Here the author has no cost figures for us but quotes the French General Staff declaration that each airplane on active service requires seventy men behind it.

Having dealt, almost too thoroughly perhaps, with recurring fallacies, Fénard proceeds to examine the battleship for signs of weakness. The submarine menace he discards; the magic hour of the submarine has passed; the notion that she could carry on a campaign unsupported at sea by surface

ships has been denounced by Castex as "a strategical fraud." What of torpedo carrying and bomb carrying aircraft attacks? Fénard thinks little of the numerous "set-piece" experiments *(tirs de polygone)* carried out against warships by American aircraft. They prove that a bomb may sink a battleship; but so may a shell plunging beneath the water. They give no promise of accuracy of fire. Here lies the weakness of the bomber. No one "spots" for her fall of shot, and if someone did, she has not the ammunition to profit by the corrections. She bases her claims on a few tremendous, but extremely lucky, blows; surface gunnery relies on a succession of weaker but more accurate blows.

But it is her reliance on the aircraft carrier that brings the airplane down, so to speak, to surface conditions. If a battleship can be out-maneuvred by torpedo aircraft or sunk by a "near miss" bomb, much more so can an aircraft carrier. If the parent ship of aircraft can keep the sea by evolving new forms of self protection or employing new escorts, so can the battleship.

The gun, Fénard thinks, is the one weapon that man can handle well at sea. Over no other weapon has he the mastery; they still leave too much to chance. The battleship, as we know her, is the highest expression of gun power, and she must continue for many years to be the ultimate destroyer of the enemy's greatest strength. No other vessel can withstand or give blows as she can. She is not the ephemeral creation of an infatuated partisan. If she sins against the warning as to putting too many eggs in one basket, she is, unhappily for France, but an illustration of the overwhelming power of riches in war. In our daily life the rich can afford to venture more than the poor.

The battleship will continue, however, to be a strong basket; already the evolution of horizontal armor has begun. Soon we may see armored gratings over the decks and greater space between decks. Protection against torpedoes will develop as fast as torpedoes themselves. The battleship's displacement cannot be foretold; it matters little—it will always seem too large in the eyes of poor nations.

Perhaps the battleships will merge into the fighting aircraft carrier of the future.

No nation can wholly ignore nor wholly rely upon any particular arm. Attempts to illegalize submarines, or any other arm, are laughable; mere diplomatic histrionics. The mere existence of any weapon is sufficient to make it worthy of close examination. War will become more complicated, but the big gun ship will remain; like artillery and the rifle ashore, it will not be dethroned by newer and less manageable vehicles and weapons.

Clavery takes a different view. Tactics, he says, have too often been exalted into the position of the dog that wags the tail, i.e., scientific inventions. He would have the positions reversed. And he does reverse them, with the result that his pen comes abruptly to a halt every now and again and has to retract a little.

Tactical science makes allowance for such things as weather conditions; material inventions do not until they are forced to. Clavery, for instance, makes no allowance for the fact that half a gale, which would not greatly disturb a battleship, would put out of effective action aircraft carriers, seaplanes, coastal aircraft, wireless controlled aircraft, and wireless controlled explosive boats. All these vehicles he ranges against the battleship and points to her doom. Skeptical though he is of American experiments as reported in the press, he expects very shortly to see an airplane carrying a 26-inch torpedo, or a little later on, a 3,600-lbs. bomb. Then, having decided that this airplane would weigh between ten and fifteen tons, and span about 220 feet from wing-tip to wing-tip, he proceeds to consider the aircraft carrier destined to launch her and recover her. This brings him to one of his abrupt pauses.

He admits that the low velocity at impact of a bomb is a serious disadvantage, and thinks the future may remedy this with some sort of gun for aircraft; but a few pages further on he claims that there is practically no limit to the weight of bombs since aircraft have only to drop them, i.e., they require no gun.

Nevertheless, the battleship is doomed. She cannot protect trade. She cannot support combined operations because she will be opposed by coastal aircraft. (Clavery here fails to recognize that a combined expedition will certainly have its own advanced air base and coastal aircraft.) She cannot blockade the enemy's ports. "The

war of 1914 from the naval point of view provides nothing more than the story of an imperfect blockade of the Austro-German fleets by the Grand Fleet at Scapa Flow on the one hand and the French squadron at Corfu on the other." This somewhat singular view of the war is preceded by the remarkable assertion that "the battleships of both sides remained inside their harbors for four years."

Clavery's remedy for all these defects in the battleship is to replace her gradually by cruisers. The *Maryland* with four triple 14-inch turrets and twenty-one knots, displaces 33,000 tons; the *Flandre*[1] with the same speed and gun power displaced 25,000 tons. The extra 8,000 tons of the *Maryland* is mainly devoted to modern under-water protection. The modern battleship requires more armor and protective compartments than she can have unless her tonnage is increased. But her tonnage has been restricted by the Washington Agreement. To reduce her gun armament or speed in favor of more protection would be to remove her last traces of utility. The solution, therefore, is to remove her armor in favor of speed and to reduce her bulk in order to leave less target for the bombers. In other words, the line of battle of the future will be composed of cruisers. The nation that builds five cruisers for every one battleship formerly built will, with the aid of aircraft, be able to blockade the enemy's ports.

The era of the cruiser has already commenced. In future she will be of sufficient displacement to keep her speed in bad weather and will carry several airplanes. As for the aircraft carrier of the future, Clavery thinks it premature to discuss her possible appearance in the line of battle; he pictures her rather as a scouting vessel of great beam.

Clavery awards the empire of the seas to the nation that follows the gospel of speed and numbers. He concludes his essay with a lurid picture of the harrying of a mammoth battleship by all the newer arms. She is eventually dispatched by a C.M.B.!

Some points on which the authors agree are as follows:

(a) The coöperation of surface cruisers with submarine cruisers will be a feature of the next war.

(b) The torpedo plane is exposed to great danger when stooping to deliver its attack. (Fénard thinks that we may some day see a glider torpedo, capable of being dropped from a height.)

(c) The airplane's weapon *par excellence* is a bomb.

(d) The escorting force of convoys will require considerable development.

Some points of disagreement are:

Fénard

The battleship will still be useful in support of landing operations.

The gun, aided by aircraft-spotting, improved sighting, etc., has a considerable future as the master weapon.

Aircraft and battleships never fought each other during the war. We cannot say what may result when they do.

The battleship remains the highest expression of offensive and defensive power.

Clavery

Landing operations are a thing of the past.

The gun has practically reached the limit of its development.

To say that guns can parry the air menace is to hug an illusion.

The battleship is already a luxury, fit only for those gold crammed nations whose pride demands the biggest things in the world.

The essays, though written in the early months of 1926 were not published until recently. Each was awarded a prize.

Value of Destroyers

Naval and Military Record, August 22.—As far as it is possible to set definite terms to the functions of any corollary unit of the battle line the value of the destroyer operating with the fleet is to screen her own capital ships from submarine and surface torpedo attack and to attack the enemy with torpedoes at any and every favorable opportunity. How far these perfectly sound theoretical principles would be realized in action is quite another matter—indeed, nowadays, how far any theoretical principle would be justified it would need a very bold

[1] This ship was one of a group of four battleships protected in 1913, but never built owing to the war.

prophet to predict. The only experience we have had in the way of a fleet action in which destroyers were employed in large numbers was Jutland. We now know beyond all question that no submarines were present in that engagement, therefore the screening value of destroyers against them could not be put to the test. That in a general way the destroyer is an effective antidote to the submarine when she suspects her presence has been pretty well demonstrated.

In the early days of the war one of Lord Jellicoe's chief anxieties was his weakness in destroyers. When the Grand Fleet assembled at Scapa in August, 1914, he had forty-two leaders and destroyers. From the information in his possession he believed the High Seas Fleet had eighty-eight destroyers attached to it, and twenty more, less than twelve years old, available for action at any selected moment. It is only fair to point out that his calculation practically included the whole of the German destroyer strength, whereas it omitted all reference to our detached forces, notably at Harwich and Dover. The position with regard to the High Seas Fleet remained unchanged down to the Battle of Jutland, whereas there was a steady improvement in the Grand Fleet. On April 1, 1915, Admiral Jellicoe's destroyer strength was fifty-eight; on April 1, 1916, it was seventy-four, and on May 31, 1918, it was eighty. Yet his chief preoccupation continued to be the disadvantage the Grand Fleet was under in consequence of enemy superiority in destroyer units. Probably he anticipated that these would play a more decisive part in the action, for the skill and daring with which the German destroyer flotillas were handled during naval maneuvers had long been notorious.

In view of this anxiety—a perfectly natural anxiety—on the part of Admiral Jellicoe regarding the destroyer position, it is rather interesting to gather his conclusions as to destroyer attacks during Jutland. In his book *The Grand Fleet* he tells us that the probable tactics of the German Fleet had been a matter of almost daily discussion, and it came to be almost taken for granted that retiring tactics combined with destroyer attacks would be adopted in the event of a meeting, which is what happened. Therefore "turn away" tactics were rehearsed. The Germans were skillful and resolute in their destroyer attacks, but a rather unexpected condition rendered these largely abortive. Admiral Jellicoe says: "The fact of the tracks of so many of the enemy's torpedoes being visible was a matter of great surprise to me and, I think, to other officers. Reports had been prevalent that the Germans had succeeded in producing a torpedo which left little or no track on the surface."

A torpedo is a slow-moving projectile. It is seldom difficult to observe when destroyers are about to launch an attack, and if the observers aloft can see the torpedoes coming, as they did at Jutland, then the menace is obviously greatly minimized. Only one of our battleships, the *Marlborough*, was effectively hit throughout the whole action. The captain of the *Collingwood* remarked that "the great value of this form of attack on a line of ships is, to me, an outstanding feature of the battle fleet action." Judging by actual results, it is a little difficult to follow this criticism. If it is meant the tactical disorder that a series of destroyer attacks may cause might have a bearing on the action, this is intelligible, but it appears to us that "the great value" of any form of attack can only be demonstrated by the damage it inflicts. Our own destroyers suffered very heavy losses in their onslaughts against the German line, but with no visible result during the daylight action. At midnight the Fourth Destroyer Flotilla came into contact with the 2nd Battle Squadron and sank the *Pommern*. This was the one decisive victory of all the torpedo tactics at Jutland, and Lord Jellicoe probably came to the conclusion that his concern as to the advantage which destroyer superiority might give to the High Seas Fleet had not been borne out by the results.

Current Articles and Books

"Naval Uses for Seaplanes and Flying Boats," Cmdr. C. H. K. Edmonds in the *Royal United Service Institution Journal*, August.

"The Americans and Their Navy," *Spectator*, July 28.

"Naval Adequacy," Capt. N. H. Goss, U.S.N., in the *Scientific American*, September.

NOTES ON INTERNATIONAL AFFAIRS

From September 4 to October 3

Prepared by Professor Allan Westcott, U. S. Naval Academy

NAVAL PROPOSALS REJECTED

America Disapproves Anglo-French Accord.—The League Assembly and Council in their September session instructed the chairman of their Preparatory Commission for a Disarmament Conference to keep in touch with the progress of negotiations among the chief naval powers, in order to call his committee together at the earliest favorable time. France and England thereupon agreed to ask the United States for a definite opinion on their agreement as to a basis for naval limitation discussion. This was done, and the Washington State Department on September 28 sent identic replies rejecting the Anglo-French scheme as "even more objectionable" than the British proposals at Geneva a year ago. The new proposals, according to the note, still set limitations on large cruisers suitable for American needs while setting no limitation whatever on cruisers with 6-inch guns or under.

The summary of the Anglo-French proposals, as given in the note, ran as follows:

The limitations which the Disarmament Conference will have to determine will deal with four classes of men-of-war.

(1) Capital ships, i.e., ships of over 10,000 tons or with guns of more than 8-inch caliber.

(2) Aircraft-carriers of over 10,000 tons.

(3) Surface vessels of or below 10,000 tons, armed with guns of more than 6-inch and up to 8-inch caliber.

(4) Ocean-going submarines over six hundred tons.

On this the American note comments thus:

As the Washington Treaty regulates the first two classes, that is, capital ships and aircraft-carriers, the Preparatory Commission will have to consider only the last two categories, so far as the signatories of that treaty are concerned.

From the foregoing summary of the agreement it appears that the only classes of naval vessels which it is proposed to limit under the Franco-British draft agreement are cruisers of or below 10,000 tons, armed with guns of more than 6-inch up to 8-inch caliber, and submarines of over six hundred tons.

The position of the government of the United States has been and now is that any limitation of naval armament to be effective should apply to all classes of combatant vessels. The Franco-British agreement provides no limitation whatsoever on 6-inch gun cruisers, or destroyers, or submarines of six hundred tons or less. It could not be claimed that the types of vessels thus left without limitation are not highly efficient fighting ships. No one would deny that modern cruisers armed with 6-inch guns, or destroyers similarly armed, have a very high offensive value, especially to any nation possessing well-distributed bases in various parts of the world. In fact, such cruisers constitute the largest number of fighting ships now existing in the world.

The limitation of only such surface vessels as are restricted in Class 3 of the draft agreement, that is, cruisers of or below 10,000 tons, armed with guns of more than 6-inch and up to 8-inch caliber, would be the imposition of restrictions only on types peculiarly suited to the needs of the United States. The United States cannot accept as a distinct class surface combatant vessels of or below 10,000 tons, armed with guns of more than 6-inch and up to 8-inch caliber. It is further clearly apparent that limitation of this type only would add enormously to the comparative offensive power of a nation possessing a large merchant tonnage on which preparation may be made in times of peace for mounting 6-inch guns.

After referring to the former British proposals at the Geneva conference for strict limitation of large cruisers and prac-

tically no limitation of small ones, the note continues:

> The limitation proposed by the British delegation on this smaller class of crusiers was so high that the American delegation considered it, in effect, no limitation at all. This same proposal is now presented in a new and even more objectionable form, which still limits large cruisers which are suitable to American needs, but frankly places no limitation whatever on cruisers carrying guns of 6 inches or less in caliber. This proposal is obviously incompatible with the American position at the three-power conference. It is even more unacceptable than the proposal put forward by the British delegation at the conference, not only because it puts the United States at a decided disadvantage but also because it discards altogether the principle of limitation as applied to important combatant types of vessels.
>
> Much of what has been said above as to vessels in Class 3 of the Franco-British agreement applies with equal or greater force to Class 4. The American Government cannot accept as a distinct class of submarines those of over six-hundred tons, leaving unlimited all submarines of six-hundred tons or under. Six-hundred ton submarines are formidable combatant vessels. They carry the same torpedoes as carried by larger submarines and of equal destructive force within the radius of their operation. They can also be armed with guns of 5-inch caliber. The United States would gladly, in conjunction with all the nations of the world, abolish the submarine altogether. If, however, submarines must be continued as instruments of naval warfare, it is the belief of the American government that they should be limited to a reasonable tonnage or number.
>
> If there is to be further limitation upon the construction of war vessels so that competition in this regard between nations may be stopped, it is the belief of the United States that it should include all classes of combatant vessels—submarines as well as surface vessels.

In conclusion the note reiterates the willingness of the United States government to coöperate with all the naval powers for real limitation, and suggests a revival of the scheme formerly proposed by France, for allowing nations to "vary the percentage of tonnage in classes within the total tonnage" so as to provide for the special needs of each nation.

WORK OF LEAGUE ASSEMBLY

NEW COUNCIL MEMBERS.—The League Assembly on September 10 elected Spain, Venezuela, and Persia to three-year terms in the League Council, taking the places of Holland, Colombia, and China. Spain gained a semi-permanent place in the council by receiving the privilege of re-eligibility.

HUGHES ACCEPTS JUDGESHIP.—Before sailing from Genoa for New York, ex-Secretary of State Charles E. Hughes sent to Geneva his acceptance of a seat in the Permanent Court of International Justice, to which he was elected by the League Assembly.

ARBITRATION AND DISARMAMENT.—One of the great problems of the League Assembly was that of setting a date for the next meeting of the Preparatory Commission for a disarmament conference. Germany clamored for an early date, whereas the British representatives strongly favored postponement at least until next March, when the new American president would be in office. Dr. Loudon, of Holland, chairman of the Commission, declared he was tired of futile meetings and would refuse to call one until representatives of the major powers had joined with him in *secret* session and come to some agreement. The final instructions given him, however, were that he should keep informed of negotiations among the major powers (meaning the chief naval powers) and call his committee at the earliest favorable date—"in any case" at the beginning of 1929. France and England promised at once to ask the United States for an opinion on their naval accord, with results given elsewhere in these notes.

In the direction of arbitration and conciliation the Assembly and Council approved a "General Act," much like the American arbitration treaties, which the Secretary-General was directed to submit to nations both within and outside the League. Along with it were sent three models of bilateral arbitration agreements.

REPARATIONS AND RHINELAND PARLEYS.—Chancellor Mueller, the new Socialist Premier of Germany, came to the Assembly intent on pushing for evacuation of the occupied territory. After a vigorous speech attacking German military preparations, Premier Briand consented to negotiate. The net result of the conferences of the six powers concerned was that the Allied Powers agreed in principle on early evacuation in return for substantial payments by Germany, to be determined by a committee of experts which would meet in the near future. Meantime a "Committee of Veri-

fication and Conciliation," under the League Council, with a German member, would supervise German fulfillment of the disarmament terms of the Versailles Treaty.

It was expected that the committee of experts would attempt to settle the larger question of the total amount of German reparations, and possibly evolve a scheme, without direct American aid, for an immediate settlement, based on flotation of German bonds guaranteed by German industries.

SOUTHERN EUROPE

ALBANIA A KINGDOM.—Ahmed Bey Zogu, since 1924 premier and dictator of Albania, assumed on September 1 the title of "king of all the Albanians." The Italian government, which in the past has found a favorable instrument in Zogu for advancing its policies in Albania, was the first to recognize the new régime, but acceptance of the change was expected on the part of other nations. Zogu is a commoner by birth, of Mohammedan faith (though he took the oath of office on both Bible and Koran), who has risen rapidly in Albanian politics. Though he is unmarried at present, the revised constitution provides for the succession of his first male heir. One of the early acts of Zogu's reign was the execution, announced in the press October 1, of eleven conspirators and the arrest of two hundred citizens for a plot against the king.

NEW POWERS FOR FASCIST COUNCIL.—At the close of September it was announced that Premier Mussolini, of Italy, had completed the final draft of his bill elevating the Fascist Grand Council to an organ of the state, which would name his successor, and exercise control over cabinet and parliament. The Council is at present composed of the presidents of the Senate and Chamber and the heads of the various branches of the Fascisti arganization. The proposed bill will enable the Council to name the complete Fascisti ticket for members of parliament, on which the electorate can only vote "yes" or "no" *en bloc*.

UNITED STATES AND LATIN AMERICA

PORTES GIL MEXICAN PRESIDENT.—On September 25 the Mexican congress in joint session unanimously elected Señor Emilio Portes Gil, at present Secretary of the Interior in the Calles cabinet, as Provisional President of Mexico, to take office on December 1. Señor Gil is reputed the richest man in Mexico and a politician of strong character. He declared he would follow the main lines of the Calles governmental program, and it was believed he would retain most of the present Calles cabinet.

TREATY AFFECTING NICARAGUA CANAL ROUTE.—Announcement was made in September of the terms of a treaty between Nicaragua and Colombia, signed last March, settling the ownership of islands on the Caribbean coast of the two countries. The treaty gives Nicaragua undisputed sovereignty over the Mosquito Coast and Great and Little Corn Islands, now leased to the United States as possible defenses for the Nicaragua canal route. Colombia gets control of the Andres Archipelago.

Notes between the United States and Colombia were also made public which, while not settling the dispute between the two countries as to ownership of the Serrana and Quita Suenos banks and the Roncador Cay, allow the United States to continue maintenance of aids to navigation in these islands, while Colombia secures fishing rights in adjacent waters.

FAR EAST

NATIONALISTS SUBDUE SHANTUNG REBEL.—The surrender in September of Chang-Tsung-Chang, former Shantung dictator, who had until recently defied Nationalist authority, marked the downfall, at least for the time being, of opposition to Nationalist control in China. The cleaning up of Chang's followers, after a brief campaign in the area northeast of Tientsin, was expected to facilitate the reopening of rail communications in northern China.

NANKING RECOGNIZED BY THE UNITED STATES.—Although no formal announcement has been made, the Washington State Department on September 27 acknowledged definitely that the tariff treaty of last July and subsequent negotiations constituted *de jure* recognition of the Nanking government. It was announced at the same time that the United States Consulate at Nanking

would soon be reopened. No decision has been made regarding the removal of the legation headquarters from Peking to Nanking.

CHINA'S FOREIGN TRADE.—Figures from the Japanese Foreign Office showing Chinese foreign trade in the past two years appeared in the August *Far Eastern Review.* They show increase of American and decline of British trade, the increase at Hongkong indicating, however, an improved feeling toward the British at Canton. The figures follow:

	1926	*1927*
Japan	31 per cent	33.5 per cent
England	20 per cent	15 per cent
United States	16 per cent	19 per cent
Hongkong	7.6 per cent	11.6 per cent
Germany	4 per cent	4.2 per cent
Russia	2.3 per cent	2 per cent
France	5.5 per cent	4.5 per cent
Italy	0.8 per cent	1.2 per cent

EFFECTS OF BOYCOTT.—A long article on the effects of Chinese boycotts against Japan, in the August *Far Eastern Review,* draws the following conclusions as to the limited effectiveness of this measure.

(1) The decrease in Japan's export trade to China in the years of the anti-Japanese boycott is amply covered, generally speaking, in the years following the boycott.

(2) It is strange that Japan's exports to China during the years of the boycott increase, roughly considered, under the category of the "unknown destination" in the export returns of Japan.

(3) Japan's exports to Hongkong during the years of the boycott generally increase.

(4) Japan's products of the cheaper quality are gradually replaced by the Chinese home products in the years of the boycott.

(5) Customs revenues of China in the years of the boycott decrease.

(6) The anti-Japanese boycott movements are quieted down prematurely, owing to the exhaustion of fanatical enthusiasm on the part of the agitators.

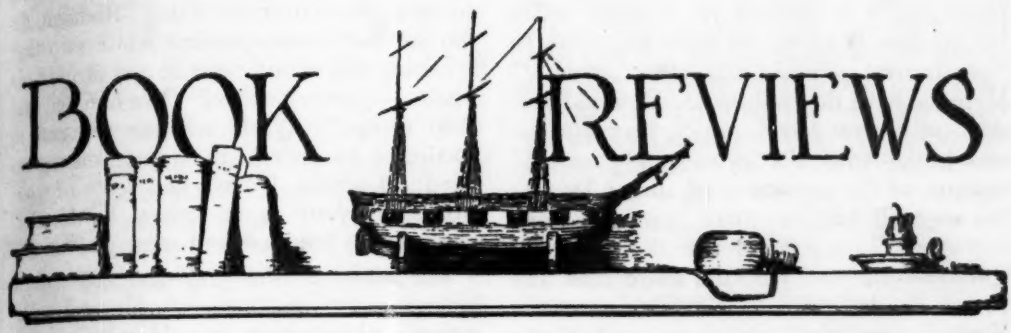
(7) To quote an American:—"Boycott cannot last forever. The nation under boycott this year may become the general favorite in China the next. Boycott of one nation cannot permanently benefit another."

CONTENTS OF OCTOBER *FOREIGN AFFAIRS*

SUMMARY OF ARTICLES.—Of chief interest from a military standpoint among articles in the October *Foreign Affairs,* is General Sir Frederick Maurice's discussion of "Military Lessons of the Great War." He calls attention first to the almost complete failure of prophets before the Great War to foresee its length, its strategy, or the immense size of its armies, which, for the first time, created warfare not by a series of battles but by constant fighting along whole frontiers. This increased size of armies was made possible by overcoming problems of transport, supply, and health. In other words, the changes in the last war were made not so much by military inventions as by peace-time progress—"changes in the ordinary life and methods of peoples, changes and developments designed for the purposes of peace." And these changes should be the chief guide in speculation on future wars. Among other lessons he notes that the "receipt for future victories is big factories," and that "the correct coördination of statescraft and strategy" is more than ever the key to military success.

On the topic of "Chinese Migration to Manchuria," W. H. Mallory says the tremendous influx of Chinese from Shantung and other provinces into Manchuria—a million in 1927 and probably two to four million in 1928—is likely to continue and will be encouraged by the Japanese government, which finds it impossible to use the country as an outlet for its own population. The remarkable thing is that Japanese control has made Manchuria "a place of refuge for a portion of China's starving millions whose destitution has been largely caused by government disorganization and civil strife." The best prospect of a peaceful solution of the Manchurian problem, but at best an uncertain one, is that "a strong and united China will be able to take control of the province, removing it from the field of ambitions of other nations."

On "The Red Army" in Russia, General Daniloff, Quartermaster General of Russian forces in the World War, declares that "all efforts of the Communist Party to implant communism in Russia have been, and still are, unsuccessful," and efforts to communize the army are likewise doomed to failure. Aggressive military action by Russia instigated by the Third International is thus "unthinkable." However, there is an intense spirit of national loyalty in Russia which, even under the Communist régime, would "increase the Red Army ten-fold" for defense of the fatherland.



BOOK DEPARTMENT

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YARNS OF A KENTUCKY ADMIRAL. By Rear Admiral Hugh Rodman, U. S. Navy (Retired). Indianapolis: The Bobbs-Merrill Co. 1928. $5.00.

REVIEWED BY LIEUT. EDWARD BRECK, *U.S.N.R. (Retired)*

The personal experiences of a man who has been both a trained observer and an important factor in many scenes of great historical significance are bound to be as valuable as they are interesting, if related, as in the present instance, with clearness and vigor, for of such are the warp and woof of history made up. Unfortunately many precious chronicles are lost, either from pure modesty or, more often, a kind of literary self-distrust on the part of one who has shared in important events, and whose testimony would be unique. The difficulty experienced by the officer in charge of the historical section of the Navy, in persuading those who had been in command of important units during the World War to contribute the detailed reports asked for by the Secretary of the Navy, is characteristic. A case in point is furnished by the present breezy volume, in which notes, diaries and occasional articles have been collected and published at the instance of a discriminating publisher to whom some of the material was shown. Fortunately, Admiral Rodman is more gifted with his pen than the majority of professional service men, and he proves to be not only a most amusing spinner of yarns, but also a sagacious judge of naval events and problems.

The book is racy and full of action. One feels the sting of the flying spray. It is the free and easy talk of an experienced and active sailor entirely off his pose, and even his sober declarations of conviction savor more of fervor than of ponderosity. It is only fair to quote the author's statement in the preface, that "this collection of yarns, notes, descriptions and opinions was not originally written for publication. . . . . It is in no sense of the word to be considered official; it is more an expression of my own personal opinions and ideas based upon an experience of fifty years in the Navy, the larger portion of which was spent at sea cruising round the world."

The author might justly aspire to write a serious chapter of the naval history of his country, after a long and varied career which included the command of the 6th Battle Squadron operating as part of the British Grand Fleet during the World War, and culminating in the supreme command of the U. S. Pacific Fleet. But in this collection of tales and comments he has rather chosen to let himself go, to set down what he thought worthy of record, and even to proceed, whenever he liked, from the sublime to the ridiculous. In fact the volume clearly portrays a man thoroughly in love with the joy of life and its humorous side, though in deadly earnest in the matter of his convictions, or when there is serious work afoot. It is inevitable in an autobiographical work of this kind that the stress of a point now and then seems a little severe; if the author's humor is

rollicking, it is often a bit ironical, while his sarcasm is biting, as when he refers to "government officials *and other savants!*" Here we have the traditional "blunt old sea-dog" of purest blood, which may also be seen in the Admiral's "private and personal" opinion of the present occupant of Doorn: "Going still further, there has never been any doubt in my mind that the arch-conspirator—the man who did more than any person to cause the World War—was the bigoted, egotistical, self-constituted God's Anointed Bill Hohenzollern."

Of Christian missionaries in the East, with whom he was much thrown, the author has a poor opinion, so far as their work is concerned. "There has always been a question in my mind," he says, "as to the advisability of sending missionaries to the so-called heathen nations, if the primary and principal reason be solely to convert them to Christianity; for, frankly, doubt will persist in my mind as to the divinity of the Christ and the inspiration of the Bible . . . . . I honestly believe that the imposition of religion on others has been one of the basic causes of war since the world began . . . . . This opinion, concerning the inadvisability of sending missionaries abroad solely to convert the heathen, is shared by many naval officers who have been thrown in contact with them. My opinion was formed after a two-year tour of duty on the Yangtze River in China. . . . ."

"Personally I am not sorry to see the missionaries expelled who were there solely for the purpose of converting the heathen. . . . . I have met some fine, cultivated and charming people among the missionaries, ... but the general run of those in the Chinese work . . . . were a narrow-minded, bigoted lot." He then charges them with sending home colored representations of the conditions in China for the purpose of eliciting further contributions.

During the Spanish-American War the author served in Dewey's squadron, and took part in the Battle of Manila Bay in the *Raleigh*, under Captain Coghlan. One incident of the fight illustrates the point that theatrical attitudes and oratorical bombast are not always in the mouths of heroes, even on historical occasions. The captain addressed his subordinate thus: "Rodman, do you see that blankety-blank white ship that is raising hell at our expense and turning his whole——battery on us? Give him hell and keep it up!" While training the gun in obedience to orders, the junior officer replied: "Captain, I don't find some of your words, or your exact orders, in the drill manual, but I understand what you mean!"

The author's ethnographical and natural history notes are both valuable and interesting, and he proves himself to be a sportsman whose keenness never degenerates into wanton destruction of life. On the contrary, in a rich experience of hunting and fishing in many parts of the world, his solicitude was always for the limitation of the bag and the correctness and comparative humaneness of the methods employed.

Admiral Rodman's personal relations with Admiral Beatty and the other British naval men with whom he worked in such complete harmony, as well as with the King and the Prince of Wales, are engaging. His recognition of the qualities of Admiral Beatty was frank and comprehensive, and of his own force he writes with justified pride, "From a close proximity and personal knowledge, from active service in the Grand Fleet, and without the slightest exaggeration, I can state unqualifiedly that there was not a single division of battleships in the Grand Fleet that was considered superior to ours in *efficiency*. Not that ours were any better than many others, but that no others were superior to ours."

Concerning the cheap charge of Anglophilism, thrown at him as at others, the Admiral is explicit. In reply to a high American official he said, "Yes, I am (pro-British), but if anyone informed you that I am pro-British at the expense of my Americanism, he didn't tell the truth."

It goes without saying that Admiral Rodman is a devout advocate of a powerful United States fleet as our first line of defense and a guarantor of peace, and he pleads with Congress and the American people to make this fleet a properly balanced one.

On the whole this book by "Old AC6" (Admiral commanding 6th Battle Squadron) is delightful reading both for the sailorman and the civilian.

AIRMAN OR NOAHS—Fairplay for Our Airmen. By Rear Admiral Murray F. Sueter, R. N. London. Isaac Pitman and Sons. 1928. $7.50

REVIEWED BY BROCKHOLST LIVINGSTON

Rear Admiral Sueter has prefaced his book with a quotation from Wordsworth:

> I speak bare truth
> As if to thee in private talk.

He continues that it is an indictment of "the Navy . . . . our father . . . . a parent so neglectful of us children of the air." The main purpose of the book, however, appears to be the correction and refutation of "Neon's" *The Great Delusion* (reviewed in PROCEEDINGS, August, 1927.) "Neon" having written that the contribution of the air service to victory was hard to find, Sueter, by tracing air development in the British Navy, now attempts to prove this conclusion false. That it is false we must all agree.

The author at times forgets his main subject to discuss submarines, with which he was connected during their infancy. He advises in this regard that "something be done to get France to cut down her new submarine construction." This apparently is a serious matter to Britain.

In support of his belief in the contribution of the air to victory, he relates the aid given by one plane at Jutland; the destruction of Zeppelins; antisubmarine patrols; the use of a spotting plane at the destruction of the *Konigsberg;* the air operations in the Adriatic; and the use of locomotive torpedoes dropped from planes in the Dardanelles, where for the first time in history, he says, enemy surface vessels were destroyed by this means.

As a history of the Royal Naval Air Service's part in the war, the book may be good. However, in venturing into the realm of predictions, the author has come upon delicate ground and thus made his work questionable. He blames "Neon" for inaccuracies. His own book contains many statements which are inaccurate or indefinite.

Aimed at giving support to the claims of the airmen, the author is sometimes indefinite as to his own belief. What better defence of the "Noahs" than his own story that at the defense of Antwerp he offered a guinea to the captain of a 4.7-gun if he could bring down a kite balloon spotting for the Germans. The balloon was brought down "with a run" with the sixth shot! And still the airmen laugh at our anti-air defense. Likewise in Chapter III, "Naval and Military Spotting," he mentions numerous drawbacks to this phase of aviation and, enthusiastic as he is, states: "Airmen cannot do impossibilities."

His section dealing with, "Bombing Battleships. Should Battleships be Abolished by Agreement at a Future Washington or Geneva Conference?" is of especial interest to naval readers. With the aid of proof supplied by such critics as Sims, Mitchell and Mark Kerr, the author attempts to show that battleships are out of place as capital ships and the 10,000-ton cruiser is sufficiently powerful to become the heaviest surface ship of the future. He concludes:

> I regard the limitation of armaments as the most important question of the day . . . . and I again make a strong plea . . . . to convene another conference before 1931, to be held at Washington, and consider the following points: Abolition of battleships by general agreement among the chief naval stations; make the Washington 10,000-ton cruiser the largest naval unit of modern navies, each nation being allowed a ratio in accordance with her needs for security, protection of trade, and world responsibilities.

To attempt a solution of such problems as "security, protection of trade and world responsibilities" (especially the latter) would be as difficult as stating the aggressor in a war.

Chapter IV, on "Airships" is also of especial interest as it treats of a subject which is engaging the attention of the general public on account of the proposed flights of the British *R-100* and the German *LZ-127*. This chapter is undoubtedly the most complete treatise and by far the most interesting, as the author appears more at home, having once been assigned as inspecting captain of airships to supervise the construction of Britain's first rigid. The author's conclusions are also so thoroughly in keeping with those of our bureau of aëronautics that we regret—not alone for this reason—that his other chapters should stamp the book as unworthy. Had he refrained from some rather inaccurate statements and restricted the book to "Airships" we would have accepted it as a first-class discourse.

Chapter V is devoted to a discussion of "Accidents to Aircraft." It is of current interest, as a board has recently investigated naval aviation accidents. Apparently the

board did not agree with Admiral Sueter's statement: "I disagree entirely with what a colleague of mine said in the House of Commons, that some of the flying accidents might be due to too much consumption of alcohol by the pilots." With no desire to cast reflections on the conduct of our flying men, an order has been issued that no one will be permitted to fly naval aircraft who has imbibed within twenty-four hours of taking off.

In discussing further the requirements of a flier, the author remarks, "The reckless young airman is of little value to the nation and soon comes to grief. The best air fighter is the man who uses his brain, nurses his machine, is not unmindful of his observer or crew, and who trains himself to be physically fit and master of the emergency. . . . . Aërial duels are won by pilots in the pink of condition, with steady nerves, coolness, good machine performance and very largely by surprise."

Other interesting chapters, although not dealing with naval aviation, are Chapters XI and XII, "The Empire and Air Development," and "Civil Aviation." In these the commercial aspects are discussed, and it is such facts as we find in them that make us positive that aviation has a wonderful future of ever-expanding usefulness and profit. As the author writes, "None but a faint-hearted fool would block air progress."

Admiral Sueter traces the development of a separate air ministry in Britain and questions us for not having created the same. He believes further that a combined department of defense is England's need. These are personal opinions which must be taken for what they are worth.

In discussing the propaganda for and against aviation, the author aptly states, "No good can come of one school of thought slinging bricks at those who differ from them." In his view, also, "an officer should subordinate personal considerations and strike a line for what he considers the best interests of the state."

In his conclusions (Chapter XV) the author states, "With the view that navies and armies can be abolished altogether I disagree profoundly, and those who encourage these ideas are, in my opinion, doing much harm to air development. . . . . The air force can never entirely replace the Navy or the Army, but it can . . . . help both these services to attain a greater efficiency." These remarks are characteristic of the book. While wishing to prove the "Noahs" wrong for their non-support of aviation, the author does not boost the airmen too profoundly. Possibly because he knows so well the limitations of aircraft, he has written a book which is, on the whole, a conservative argument. As literature, the book is poor and he apologizes for it. As a historic treatise, it is good. Had he confined himself to fact it would have been an even more valuable contribution. If there are a few rather childish "slams" at the "Noahs," it is a pity. No matter how conservative—or radical—the views of the reader, he must agree "that aircraft, whatever their defects may be, will be of some considerable value in future operations, should we ever have the misfortune to be forced into another war." America thoroughly concurs with this theme and if the author has had difficulty in "putting over" his argument we may set it down to "the sailor's usual inexperience of literary work."

THE WHITE HOUSE
WASHINGTON

May 7, 1923.

Dear General Richards:

I am very grateful to you and the members of your committee for the invitation to attend the presentation of the portrait of General Harbord at the Army and Navy Club this evening, and I am sorry it is not possible for me to accept. This portrait being the gift of the Marine Corps conveys not only a fine and thoroughly deserved compliment to General Harbord, but beyond that it suggests the particularly commendable amiability which marks the relationship among the different branches of the service. It recalls the fact that this very sentiment of generous cooperation and mutual helpfulness was precisely the factor which so greatly increased the efficiency of all branches of the service during the World War. I am particularly pleased that the desire to recognize General Harbord's service should have been made the occasion for this testimony to the good feeling which prevails. His command, I believe, embraced units from all the branches of the armed forces, and the splendid record which it made is the best proof that he so richly deserves the compliment that is being extended.

Most sincerely yours,

Warren G. Harding

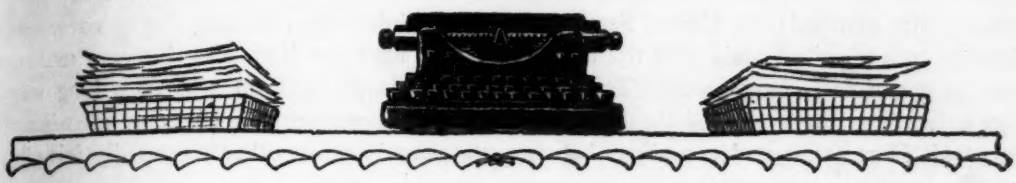
Brigadier General George Richards, U.S.M.C.,
The Harbord Portrait Committee,
The Army and Navy Club,
Washington, D. C.

LETTER FROM THE PRESIDENT CONCERNING THE PRESENTATION CEREMONIES WHEN THE PORTRAIT OF MAJOR GENERAL HARBORD WAS PRESENTED TO THE ARMY AND NAVY CLUB, WASHINGTON, D. C.

MAJOR GENERAL JAMES G. HARBORD

Photograph of portrait of the distinguished officer who commanded the 4th Brigade of Marines in Belleau Woods, presented to the Army and Navy Club of Washington, D. C., by a committee headed by Brigadier General George Richards, on behalf of nearly a thousand officers and former officers of the Marine Corps who contributed to the fund for the preparation of the picture. The portrait is life-size, and is the work of Mr. Richard S. Meryman, a widely known portrait painter. Its frame is of handsomely carved oak, bearing the devices of the Army, Navy, and Marine Corps, together with the insignia of the 2nd Division, which was composed of contingents from all three branches of the service.

SECRETARY'S NOTES



We have with us

Following our policy of featuring the various branches of the Navy in the issues of the PROCEEDINGS, this issue is devoted to the United States Marine Corps. General Lejeune, in his "Foreword," gives a brief outline of the history and ideals of the corps. There is no need to eulogize the marines; their record, written in the history of this country, is more than sufficient for that purpose. The marines are part of the Navy, and the Navy glories in their accomplishments.

Colonel Otto, in his article on Belleau Woods, gives the enemy estimate of the marine as a soldier. After reading this description of that critical series of battles, one feels like taking one's hat off to anyone who fought at Belleau Woods, regardless of the side on which he fought.

In connection with Colonel Otto's article, the editor wishes to express his appreciation to Chief Pay Clerk O. E. Gutmann, U.S. Marine Corps, Professor Henry Bluestone, U.S. Naval Academy, and Lieutenant Commander A. H. Rooks, U.S. Navy, who are jointly responsible for the translation of the German text.

The fine morale and fighting spirit of the marines at Belleau Woods is typical of them in whatever they undertake. Incidentally, there probably has never been another organization engaged in as many operations in so many parts of the world. "The marines have landed and have the situation in hand," is quite a familiar line in the press.

We feel sure that this issue of the PROCEEDINGS will prove most interesting and instructive and will give our readers a realization of the vital questions that were settled at Belleau Woods, to the everlasting credit and glory of the Marine Corps.

Where frankness pays

It is refreshing to read this government's straight-forward and clear reply to the British-French understanding (to limit the Navy of the United States?). This was quite in contrast to the British and French methods. In fact, it was only when the note from this government came out that anything like frankness was evident.

It is reported that France proposes to submit the entire British-French *secret* negotiations to the United States in the hope of reaching an amicable agreement; *but,* no matter what the outcome, France intends to adhere to her obligations to Great Britain!

In other words, under their agreement, Great Britain was to get something and France was to get something, and the Navy of the United States was to pay the piper as it did in 1921.

It would probably have gone through on schedule; a vast propaganda would have endeavored to place the responsibility for failure of the United States to reduce her Navy

still further below the 5-5-3 principle entirely upon the naval experts of the United States; but France "spilled the beans!" France was so overjoyed over the French advantages by such an agreement, that she had to tell her people of this masterly piece of statesmanship.

It is statesmanship like that which brings on wars. Italy and Spain, in the Mediterranean, are alarmed; the United States sees secret diplomacy replacing "open covenants openly arrived at"; Russia uses the occasion to stir up more ill feeling between nations and an era of suspicion prevails. The open note of this government will go a long way towards giving the people of the countries concerned an opportunity of seeing what is apt to result from secret understandings between states and against other supposedly friendly states.

The Fleet in 1908

Twenty years ago this month the battleships, in their cruise around the world, visited the Chinese ports of Hongkong and Amoy. The first squadron visited Hongkong while the second squadron visited Amoy.

The Hongkong entertainment was elaborate and easily accomplished. Amoy was a different matter. Cholera was present in the native city, so the Chinese government built a temporary town on a nearby island. Buildings were erected, rickshaws and rickshaw men were brought from Peking, dancers and entertainers were imported, and the entertainment went on apace. And all this without any evident fuss.

During our stay at Amoy, the birthday of the Empress Dowager was the occasion of a very elaborate luncheon and much toasting. On our return to Manila we were much surprised to learn of the almost simultaneous deaths of the Emperor and the Empress Dowager. In fact, the opinion prevailed that the toasts we had drunk in Amoy had been posthumous! History has disproved this, however.

On the departure of the fleet, very handsome furniture that had been brought to Amoy to fit out the buildings was most graciously presented to the various commanding officers of the ships. In the days of the Empress Dowager, things were done in a very grandiose manner.

History repeats itself

In last month's issue of the PROCEEEDINGS, the article dealing with the naval gun factory gave one something about which to think. Apparently, universal peace was assured more than a century and a quarter ago. In *that day* we reduced our Navy and dismantled our ships. We even sent our guns and mounts to the Sultan of Morocco as a gesture of good will. In a couple of years we were obliged to send our men-of-war after them to demand that our rights on the high seas be respected. We allowed our ships to rot at their anchors, in that era of peace and good will, and ten years later our capitol was burned by the enemy, because we were not prepared to defend ourselves.

But if anyone mentions historical precedent in connection with the necessity for national defense, he is accused of rattling the sword in the scabbard.

Let the Institute serve you

For some time past, the Naval Institute has been helping its members by buying for them such books as they might order and allowing them a five per cent discount on the list price. We have bought thousands of dollars worth of books for our members, regular and associate, at considerable saving to them.

At the last meeting of the Board of Control it was decided to allow regular and associate members a ten per cent discount on all books published by the Naval Institute. It can

readily be seen that savings in cost of books will go a long way towards paying for membership dues.

Buy all of your books through the Naval Institute and save money. Join the Institute in order to enjoy this advantage.

What about the Pictorial Log

Last issue we suggested the possibility of bringing out a book of the cruise around the world in 1907-1909, made up of the illustrations that have been appearing in the PROCEEDINGS. We have found out that such a book, with semi-flexible cover of imitation leather, Navy blue with gold lettering, printed on superior quality of white paper, can probably be sold for from $2.50 to $3.00 per copy. There will be no written matter other than the itinerary and the legends that now appear on the illustrations.

A card to the Naval Institute, indicating whether you would want a copy of such a book, would help us in determining if there is a demand for it.

As we suspected

By the way, we have learned that John Smith, taxpayer, who groans every time the naval program is mentioned, is known in Russia as Ivan Smithski. We imagine they both pay about the same amount of taxes.

What everyone should know

We wonder if the members of the Naval Institute realize the extent of the work the Institute does in the book-publishing business? During the last year, we have printed some thirty-six thousand volumes. This would be simple if it were only one book, or if the work was simple text printing. But most of the books are scientific, with complicated figures and compilations, and the editions are small. We have revised, or printed new, twenty books, in editions of from three hundred to two thousand copies. One ran to ten thousand copies. Any publisher realizes the expense of small editions.

The policy of the Institute has been to revise books as often as need be to keep up with modern thought and development. We are here to serve.

And the books are issued to the service at the cost of operation. The annual profit of the Naval Institute is actually less than could be earned by putting out its resources at an annual interest rate of 4½ per cent.

Thousands of books have been printed each year, hundreds of thousands of dollars have been saved the members during the fifty-five years the Naval Institute has been organized. It is a worth while organization and should be supported by every naval officer.

Membership in the Naval Institute is not in the nature of a contribution. The PROCEEDINGS are worth the amount one pays for membership. The mere fact that a brother officer subscribes is no excuse for your neglecting your obligations to the Naval Institute. If you have access to copies of the PROCEEDINGS, have your copy mailed to your home-town library.

Many members do this; it gives you a sense of having done the right thing; also, it brings the Navy to your home-town folks.

More light on the "America"

The following correspondence relative to the line-of-battle ship *America,* which was turned over to the French in the Revolutionary War and was reputed to have been captured by the British (see Secretary's Notes of the August issue), casts some shadow of doubt on the *America's* end as described in that issue. Captain Roy C. Smith, U. S. Navy (retired) submits the correspondence which was originated by him while he was naval attaché in Paris. It follows:

Naval Attaché
Telegraphic Address
"Alusna, Paris"

AMERICAN EMBASSY
18, Avenue Kléber, Paris

April 17, 1906

MY DEAR ADMIRAL LUCE:

I enclose you a copy of a letter from Prof. Lacour-Gayet on the subject of the identity of the *Franklin,* captured by the English at the Battle of the Nile.

Prof. Gayet is of the staff of the Ecole Supérieure de Marine and is considered a high authority in all matters of naval history. From his letter it seems to result that our *America* had disappeared long before the battle of the Nile, and that orders had been given to build a new ship of the same name; also that there was no *Amérique* prior to 1789. Hence it would result that if there ever was an *Amérique* she appeared later. The *Franklin* may thus have been a completely new ship, or the rebuilt *America,* which may have been called first either *America* or *Amérique,* and then re-named *Franklin.**

In view of the above, the footnote ending at page 82, Vol. II., of Buell's *Paul Jones,* London edition, which states that there was already an *Amérique* in the French Navy, and that King Louis directed that the *America* be re-named the *Franklin,* would seem to be in error.

With much respect,

Very sincerely yours,

ROY C. SMITH

Enclosure
Rear Admiral
Stephen B. Luce, U. S. Navy
Newport, Rhode Island

*Or the name of the new ship may have been changed to *Franklin* in building.

(Translation of copy)

Paris, 3 April 1906.

DEAR SIR:

I should have been happy to give you the information on the history of the *America,* the *Amérique,* and the *Franklin* about which you do me the honour of inquiring in your letter of 28 March, but I have no exact information on the identity of the *Amérique* and the *Franklin.* As I have not searched through the archives of the Navy for the period during the Revolution I know nothing of the *Franklin* except its conduct at Aboukir.

I have been wondering whether it is not the *America* in which you are interested, for as far as I can say, I do not know a French vessel by the name of the *Amérique*—and I believe there never was one. The one that existed at that time was the *America.*

You will find on pages 699-703 of my *Marine militaire de la France sous le règne de Louis XVI* (Paris, Champion, 1905) the list of the French ships of that period. Of all those which took part in the War of Independence or which were in service about 1789, I am, I believe, justified in saying there was no *Amérique;* but there was the *America* which was the ship given by the government of the United States. It seems quite inadmissible that during that period and even after 1789 there should be two ships in commission at the same time, one the *America* the other the *Amerique,* on account of the confusion and error which would have risen therefrom.

On page 417 of my book you will find (with the note concerning the archive document from which I took the information) some remarks on the history of the *America* before 1789. This ship had been given to France by the Congress of the United States on 3 September, 1782, at Boston, to replace the *Magnifique* which had just been lost on one of the islands off the entrance to that port. Although constructed with great care the *America* was out of the service at the end of four years, because of the poor quality of wood used in her construction. Marshal de Castries who was Minister of Marine at the time decided (20 August, 1786) that the ship should be broken up and replaced by another seventy-four "of the same name."

That is all I know concerning the *America,* and I dare say there is no more in the archives of the Navy about her before 1789. Moreover, before 1789 there was no *Amérique* in the French fleet, but an *America* only.

Is one to suppose that after 1789 the *America* became the *Amérique,* which in turn became the *Franklin?* I know nothing of this nor do I see how one could find the answer in the archives. As long as there is no solution of your question to be had from the Ministry of Marine there would only remain the fortunate chance of a discovery which would clear up the problem. If I happen on anything while searching the files of the Revolutionary period I shall inform you at once; that, however, is indefinite and hardly probable.

In any case I shall be happy to be of assistance to you on any question of this kind about which I might furnish information. My book has made me live in close relationship with your country during that period of the War of Independence which was so glorious for you and for us. I have had the honor of being a member of the Franco-American Commission which published in 1903 the *Combatants francais de la guerre américaine.* I repeat that it will ever be a pleasure to me to be of service to you.

I have found in my note the most detailed remark of what I had given you on page 417 of my book; I will transcribe this passage at the end of my letter.

I hope that you will excuse the delay of several days which has occurred in answering you. Unavoidable circumstances have kept me, I regret to say, from applying myself sooner to the little question of the *America.*

I beg you, dear sir, to accept the expression of my highest esteem.

G. LACOUR-GAYET
Professor at the
School of Higher Naval Studies

Enclosure concerning the *America.*

A report originating at Brest on the poor condition of the *America* states as follows:

"This event conclusively proves that the wood of North America is of no use in construction," for "the different parts of the vessel seem to have been finished with the most careful workmanship." (Marshal de Castries to the King [20 April 1786]).

"The very careful inspection of the ship *America* (given by the United States to Your Majesty) which has just been made at Brest shows that vessel, though built but four years ago, to be entirely rotten and that it is quite impossible to preserve her. Moreover the complete alteration of the ship which would deprive her of the qualities which a vessel of her rate should have, would be worse than useless. Therefore I have the honor to submit to Your Majesty that the ship be broken up and that another seventy-four gun vessel with the same name be constructed."

"Bon" Louis XVI

Archives de la Marine B1 101 sheet 92 and 93.

A tragedy of the sea

Ships, like persons, have personality. When one sees a ship with a glorious history reduced to hit-or-miss tramp trade, one feels a sense of depression. The following letter from an associate member concerns the *Gloucester,* of Santiago fame:

Charleston, S.C.
September 4, 1928.

The Editor,
The U. S. Naval Institute Proceeedings.
Annapolis, Md.

Dear Sir:

Shortly after reading Commander L. J. Gulliver's account of "The Gloucester at Santiago" I came across an Associated Press story relative to the same ship. This latter is an account of the *Gloucester's* post-war life as filibuster and fruit ship, an interesting nautical version of the old adage about the sword being beaten into the plowshare. The article originated in Tampa, Florida, the present "home port" of the *Gloucester,* and as it may not have come to your attention I take the liberty of enclosing it.

A soldier of fortune, once high in the service of the United States Navy, then a prominent figure in Central American politics, today does duty as a prosaic day laborer.

Thus runs the romantic history of the steam cruiser *Florida,* originally the pride of the multi-millionaire owner, which each week steams through the Gulf of Mexico to Baracoa, Cuba, and returns to Tampa with a cargo of bananas.

Built in 1891 for J. Pierpont Morgan, she was christened the *Corsair* and for nine years was seen among the luxurious yachts around Newport.

When the United States declared war with Spain in 1898, the *Corsair* was purchased by the Navy Department and re-named *Gloucester.* Equipped with a crew of bluejackets and a set of rapid-fire guns, she had a prominent place in the naval history of the war, participating valiantly in several engagements.

Later the ship returned to Central-American waters with the title of *Angelita*—"Little Angel" or "Angel Deliverer of the Oppressed"—apparently considered more appropriate for her next venture—that of carrying guns to Central-American republics. She was seized recently by the Cuban government while lying in the port of Havana with a load of rifles under her hatches.

For some time thereafter she moved about the tropics as a freight boat. About this time T. J. Wineman of Tampa, who had been off the sea for two years, became interested in the ship and induced local shipping people to purchase her. He is now in charge of her engine room.

And so ends the story. The identity of Wineman is not revealed, nor is the reason for his interest in the former *Gloucester* disclosed. Perhaps he was one of the ninety heroes of her crew. It would be interesting to learn whether or not such is the case.

Very truly yours,

Ashley Hasley, Jr.
Associate Member, the U. S. Naval Institute.
51 George St., Charleston, S. C.